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(FILE 'HOME' ENTERED AT 16:54:44 ON 25 FEB 2010)

FILE 'HCAPLUS' ENTERED AT 16:55:03 ON 25 FEB 2010

L1 1 SEA SPE=ON ABB=ON PLU=ON US20070117984/PN
D L1 ALL

FILE 'WPIX' ENTERED AT 16:58:29 ON 25 FEB 2010

L2 1 SEA SPE=ON ABB=ON PLU=ON US20070117984/PN
D L2 FULL

FILE 'REGISTRY' ENTERED AT 16:59:59 ON 25 FEB 2010

L3 QUE SPE=ON ABB=ON PLU=ON V/ELS
L4 QUE SPE=ON ABB=ON PLU=ON P/ELS
L5 QUE SPE=ON ABB=ON PLU=ON N/ELS
L6 QUE SPE=ON ABB=ON PLU=ON O/ELS
L7 2114 SEA SPE=ON ABB=ON PLU=ON L3 AND L4 AND L5 AND L6
L8 QUE SPE=ON ABB=ON PLU=ON (CR OR MO OR W OR FE OR RU
OR CO OR RH OR IR OR NI OR PD OR PT OR ZN OR NB)/ELS
L9 698 SEA SPE=ON ABB=ON PLU=ON L7 (L) L8

FILE 'HCAPLUS' ENTERED AT 17:03:45 ON 25 FEB 2010

L10 380 SEA SPE=ON ABB=ON PLU=ON L9

FILE 'ZCAPLUS' ENTERED AT 17:03:58 ON 25 FEB 2010

L11 QUE SPE=ON ABB=ON PLU=ON CAT# OR CATAL?

FILE 'HCAPLUS' ENTERED AT 17:06:01 ON 25 FEB 2010

L12 158 SEA SPE=ON ABB=ON PLU=ON L10 AND L11

FILE 'ZCAPLUS' ENTERED AT 17:07:46 ON 25 FEB 2010

L13 QUE SPE=ON ABB=ON PLU=ON SIO2 OR AL2O3 OR ZRO2 OR
TIO2
L14 QUE SPE=ON ABB=ON PLU=ON ?OXIDE?
L15 QUE SPE=ON ABB=ON PLU=ON (SI OR SILICON OR ALUMINUM
OR ALUMINIUM OR TITANIUM OR ZIRCONIUM)
L16 QUE SPE=ON ABB=ON PLU=ON L15 (3W) L14
L17 QUE SPE=ON ABB=ON PLU=ON ALUMINA OR SILICA OR
ZIRCONIA OR TITANIA
L18 QUE SPE=ON ABB=ON PLU=ON SUPPORT#
L19 QUE SPE=ON ABB=ON PLU=ON (L13 OR L16 OR L17) (4A)
(L18)

10/566,868

FILE 'HCAPLUS' ENTERED AT 17:11:18 ON 25 FEB 2010
L20 41020 SEA SPE=ON ABB=ON PLU=ON (L13 OR L16 OR L17) (4A)
(L18)
D L20 1-5 KWIC
L21 7 SEA SPE=ON ABB=ON PLU=ON L12 AND L20
D L21 1-7 KWIC
SEL L1 RN

FILE 'REGISTRY' ENTERED AT 17:13:38 ON 25 FEB 2010
L22 16 SEA SPE=ON ABB=ON PLU=ON (108-99-6/BI OR 100-54-9/BI
OR 58834-75-6/BI OR 7439-88-5/BI OR 7439-89-6/BI OR
7439-98-7/BI OR 7440-02-0/BI OR 7440-03-1/BI OR 7440-05-3
/BI OR 7440-06-4/BI OR 7440-16-6/BI OR 7440-18-8/BI OR
7440-33-7/BI OR 7440-47-3/BI OR 7440-48-4/BI OR 7440-66-6
/BI)
D SCA

FILE 'HCAPLUS' ENTERED AT 17:19:41 ON 25 FEB 2010
L23 1069 SEA SPE=ON ABB=ON PLU=ON L7
L24 196 SEA SPE=ON ABB=ON PLU=ON L23 (L) L11
L25 12 SEA SPE=ON ABB=ON PLU=ON L24 AND L19
L26 5 SEA SPE=ON ABB=ON PLU=ON L25 NOT L21

FILE 'ZCAPLUS' ENTERED AT 17:20:56 ON 25 FEB 2010
L27 QUE SPE=ON ABB=ON PLU=ON VPO
L28 QUE SPE=ON ABB=ON PLU=ON VANADIUM# (2W) PHOSPHATE#
L29 QUE SPE=ON ABB=ON PLU=ON (L27 OR L28) AND L11

FILE 'HCAPLUS' ENTERED AT 17:22:04 ON 25 FEB 2010
L30 1011 SEA SPE=ON ABB=ON PLU=ON (L27 OR L28) AND L11
D L30 10-20 KWIC

FILE 'REGISTRY' ENTERED AT 17:23:23 ON 25 FEB 2010
L31 1 SEA SPE=ON ABB=ON PLU=ON 108-99-6

FILE 'HCAPLUS' ENTERED AT 17:23:40 ON 25 FEB 2010
L32 5602 SEA SPE=ON ABB=ON PLU=ON L31
L33 3179 SEA SPE=ON ABB=ON PLU=ON "3-METHYLPRIDINE" OR
"3-PICOLINE"
L34 6813 SEA SPE=ON ABB=ON PLU=ON L32 OR L33
L35 20 SEA SPE=ON ABB=ON PLU=ON L30 AND L34
D L35 1-5 KWIC
L36 20 SEA SPE=ON ABB=ON PLU=ON L35 NOT (L21 OR L26)

L37 42 SEA SPE=ON ABB=ON PLU=ON L30 AND L19
 D L37 6-9 KWIC
 L38 39 SEA SPE=ON ABB=ON PLU=ON L37 NOT (L36 OR L21 OR L26)
 L39 23 SEA SPE=ON ABB=ON PLU=ON L38 AND PY<=2004 NOT P/DT
 L40 9 SEA SPE=ON ABB=ON PLU=ON L38 AND (PD<=20040730 OR
 PRD<=20040730 OR AD<=20040730) AND P/DT
 L41 32 SEA SPE=ON ABB=ON PLU=ON L39 OR L40
 D L41 KWIC
 L42 12 SEA SPE=ON ABB=ON PLU=ON L36 AND PY<=2004 NOT P/DT
 L43 8 SEA SPE=ON ABB=ON PLU=ON L36 AND (PD<=20040730 OR
 PRD<=20040730 OR AD<=20040730) AND P/DT
 L44 20 SEA SPE=ON ABB=ON PLU=ON L42 OR L43
 L45 2 SEA SPE=ON ABB=ON PLU=ON L21 AND PY<=2004 NOT P/DT
 L46 2 SEA SPE=ON ABB=ON PLU=ON L21 AND (PD<=20040730 OR
 PRD<=20040730 OR AD<=20040730) AND P/DT
 L47 4 SEA SPE=ON ABB=ON PLU=ON L45 OR L46
 L48 0 SEA SPE=ON ABB=ON PLU=ON L26 AND PY<=2004 NOT P/DT
 L49 4 SEA SPE=ON ABB=ON PLU=ON L26 AND (PD<=20040730 OR
 PRD<=20040730 OR AD<=20040730) AND P/DT

FILE HOME

FILE HCAPLUS

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MOST RECENT UPDATE: 201013 <201013/DW>

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>>> Japanese FI-TERM thesaurus in field /FCL added <<<

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=> d 141 1-32 bib abs ind

L41 ANSWER 1 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2004:832556 HCAPLUS Full-text
 DN 142:447426
 TI Structured metal **catalysts** - a way to intensify chemical processes
 AU Kolodziej, Andrzej; Lojewska, Joanna; Krajewski, Waldemar
 CS Inst. Inz. Chem., PAN, Gliwice, 44-100, Pol.
 SO Inzynieria Chemiczna i Procesowa (2004), 25(3/2), 1121-1126
 CODEN: ICPRDT; ISSN: 0208-6425
 PB Oficyna Wydawnicza Politechniki Wroclawskiej
 DT Journal
 LA Polish
 AB Structured **catalytic** packings are useful for intensification of mass and heat transfer during **catalytic** processes of full or selective oxidation. Methods of **catalyst** deposition on structured metal surfaces are described, and their activity in various oxidation processes are shown. In the first example a vanadium-phosphorus oxide (VPO) **catalyst** was deposited on leaf Cr-Al steel carrier. This **catalyst** was tested for selective oxidation of n-butane to maleic

anhydride, giving rise to a 70% increase in yield, in comparison with the dumped VPO catalyst. Calcns. based on the model developed for the reaction the value of activation energy 87 kJ/mol was obtained, close to literature data. The process of catalytic combustion of CO and organic compds. carried out in ceramic monoliths face the problem of low mass transport, therefore structure of a heap of fine wire gauze was proposed as catalytic carrier. A comparison of the heat transfer coefficient calculated theor. for monoliths and gauzes confirms that in short channels (gauze eyelets) the velocity profiles cannot fully develop, which brings about a significant increase in transport coeffs. A real challenge for the application of fine gauze structures is the catalyst deposition. The Langmuir film deposition method was applied to transfer monomol. layers from water surface onto the metal carrier surface to deposit washcoat and cobalt catalyst on the surfaces of Cr-Al and Cr-Ni steels. Prior to the transfer the samples were oxidized at 1000°. The metalloorg. compds. of Al and Co were deposited and the catalysts were calcined. The sample surfaces were monitored by SEM and XPS methods at various stages of preparation. The results show high metal distribution on the surface.

- CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 27, 45, 67
- ST structured metal catalyst prepn selective oxidn; gauze
steel substrate metal oxide oxidn catalyst; leaf steel
substrate vanadium phosphorus oxide oxidn catalyst
- IT Heat transfer
(in chromium-nickel steel gauze-supported cobalt and aluminum
catalyst for carbon monoxide oxidation)
- IT Surface area
(of chromium-nickel steel gauze-supported cobalt and aluminum
catalyst for carbon monoxide oxidation)
- IT Activation energy
(of oxidation; structured chromium-aluminum steel leaf-supported
vanadium phosphorus oxide catalyst for oxidation of butane
to maleic anhydride)
- IT Oxidation
Oxidation catalysts
(preparation of structured metal catalysts containing leaf or
gauze steel substrates as a way to intensify oxidation reactions)
- IT 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst and catalytic support;
chromium-nickel steel gauze-supported cobalt and aluminum
catalyst for carbon monoxide oxidation)
- IT 1307-96-6, Cobalt oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(chromium-nickel steel gauze-supported cobalt and aluminum

catalyst for carbon monoxide oxidation)

IT 11136-69-9, Chromium nickel steel, uses
 RL: CAT (Catalyst use); USES (Uses)
 (gauze; preparation of structured metal **catalysts** containing leaf or gauze steel substrates as a way to intensify oxidation reactions)

IT 56321-70-1, uses
 RL: CAT (Catalyst use); USES (Uses)
 (leaf and gauze; preparation of structured metal **catalysts** containing leaf or gauze steel substrates as a way to intensify oxidation reactions)

IT 630-08-0, Carbon monoxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of structured metal **catalysts** containing leaf or gauze steel substrates as a way to intensify oxidation of)

IT 65506-75-4, Vanadium phosphorus oxide
 RL: CAT (Catalyst use); USES (Uses)
 (structured chromium-aluminum steel leaf-supported vanadium phosphorus oxide **catalyst** for oxidation of butane to maleic anhydride)

IT 106-97-8, n-Butane, reactions 108-31-6, Maleic anhydride, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (structured chromium-aluminum steel leaf-supported vanadium phosphorus oxide **catalyst** for oxidation of butane to maleic anhydride)

L41 ANSWER 2 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2004:754892 HCAPLUS Full-text
 DN 141:231307
 TI Effect of the support on the surface composition of **vanadium phosphate catalysts** in the oxidative dehydrogenation of ethane
 AU Casaletto, M. P.; Lisi, L.; Mattogno, G.; Patrono, P.; Ruoppolo, G.
 CS Institute of Nanostructured Materials, CNR, Palermo, I-90146, Italy
 SO Surface and Interface Analysis (2004), 36(8), 737-740
 CODEN: SIANDQ; ISSN: 0142-2421
 PB John Wiley & Sons Ltd.
 DT Journal
 LA English
 AB Vanadyl phosphate **catalysts** supported on different oxides (γ -Al₂O₃, TiO₂, SiO₂) have been investigated by XPS. The surface chemical composition has been studied as a function of the thermal treatment under oxidizing (calcination) or reaction conditions in the oxidative dehydrogenation of ethane. Dispersion of vanadyl phosphates on γ -Al₂O₃ and TiO₂ results in the formation of vanadium species in different oxidation states, i.e. V⁵⁺ phosphate, V⁵⁺ and V⁴⁺ oxide

species, whose relative fraction depends both on the support and on the reaction temperature. A progressive reduction of vanadium species occurs in the samples as an effect of the temperature. Vanadyl phosphates exhibit a stronger interaction with the titania support, which undergoes surface modifications after impregnation, thermal treatments and catalysis runs. A noticeable interaction of the alumina support and a poor dispersion of the active phase on silica are also revealed by XPS.

- CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 23, 51, 73
- ST support surface compn vanadium phosphate catalyst oxidative dehydrogenation ethane
- IT Calcination
 Catalyst supports
 Heat treatment
 Oxidation
 Surface composition
 Valence
 (effect of support on surface composition of vanadium phosphate catalysts in oxidative dehydrogenation of ethane)
- IT Oxides (inorganic), uses
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (effect of support on surface composition of vanadium phosphate catalysts in oxidative dehydrogenation of ethane)
- IT Dehydrogenation catalysts
 (oxidative; effect of support on surface composition of vanadium phosphate catalysts in oxidative dehydrogenation of ethane)
- IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses 14542-94-0, Vanadium phosphate
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (effect of support on surface composition of vanadium phosphate catalysts in oxidative dehydrogenation of ethane)
- IT 74-84-0, Ethane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (effect of support on surface composition of vanadium phosphate catalysts in oxidative dehydrogenation of ethane)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 3 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2004:741433 HCAPLUS Full-text
DN 141:380161
TI The novel and highly selective fumed silica-supported VPO
for partial oxidation of n-butane to maleic anhydride
AU Xiao, C. Y.; Chen, X.; Wang, Z. Y.; Ji, W. J.; Chen, Y.; Au, C. T.
CS Mesoscopic Chemistry Lab, Department of Chemistry, Nanjing
University, Nanjing, 210093, Peop. Rep. China
SO Catalysis Today (2004), 93-95, 223-228
CODEN: CATTEA; ISSN: 0920-5861
PB Elsevier B.V.
DT Journal
LA English
AB By applying fumed SiO₂ as a support and using polyethylene glycol
(PEG) as an additive in the preparation medium and a deposition-
precipitation method based on the organic phase, we prepared new
fumed SiO₂-supported VPO catalysts. The catalysts are the most
selective in comparison to the various supported VPO counterparts for
the partial oxidation of butane to maleic anhydride (MA). At 653K
the catalysts provided butane conversion 33-40% and MA selectivity
87-65 mol%. The catalysts not only showed good performance at lower
reaction temps., but also maintained higher MA selectivity at
different loadings. In addition to the unique nature of fumed SiO₂,
the highly uniform dispersion of the VPO component and the involved
VPO-support interaction, co-existence of the predominant (VO)₂P₂O₇
phase and the minor VOP₄ phase may also be beneficial to the good
performance on these fumed SiO₂-based catalysts. In addition,
broadening of the (2 0 0) diffraction line of (VO)₂P₂O₇ phase is an
indication of structural disorder, one considered to be relevant to
MA formation.
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67
ST vanadyl pyrophosphate catalyst prepn fumed silica
supported; vanadium phosphorus oxide catalyst selective
oxidn butane; maleic anhydride prodn butane oxidn selective
catalyst
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(in production of selective fumed silica-supported VPO for
partial oxidation of butane to maleic anhydride)
IT Oxidation catalysts
(selective; production of selective fumed silica-supported
VPO for partial oxidation of butane to maleic anhydride)
IT 1314-62-1, Vanadium pentoxide, reactions 7664-38-2, Phosphoric

acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst precursor; in production of selective fumed silica-supported VPO for partial oxidation of butane to maleic anhydride)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

(fumed; selective silica-supported VPO for partial oxidation of butane to maleic anhydride)

IT 25322-68-3, Polyethylene glycol

RL: NUU (Other use, unclassified); USES (Uses)

(in production of selective fumed silica-supported VPO for partial oxidation of butane to maleic anhydride)

IT 12359-27-2P, Vanadyl phosphate 58834-75-6P, Vanadyl pyrophosphate
65506-75-4P, Phosphorus vanadium oxide

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(production of selective fumed silica-supported VPO for partial oxidation of butane to maleic anhydride)

IT 108-31-6P, Maleic anhydride, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(selective fumed silica-supported VPO for partial oxidation of butane to maleic anhydride)

IT 106-97-8, Butane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(selective fumed silica-supported VPO for partial oxidation of butane to maleic anhydride)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 4 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2004:504957 HCAPLUS Full-text

DN 141:191097

TI Effect of the preparation technique on the catalytic performances of TiO₂ supported vanadium phosphate in the oxidative dehydrogenation of ethane

AU Casaletto, M. P.; Lisi, L.; Mattogno, G.; Patrono, P.; Pinzari, F.; Ruoppolo, G.

CS Istituto per lo Studio dei Materiali Nanostrutturati, CNR, Palermo, Italy

SO Catalysis Today (2004), 91-92, 271-274

CODEN: CATTEA; ISSN: 0920-5861

PB Elsevier Science B.V.

DT Journal

LA English

- AB TiO₂ supported VOP₄ **catalysts**, prepared by direct impregnation of TiO₂ with VOP₄ or by dispersing a V₂O₅ precursor on previously phosphated titania, have been investigated for the oxidative dehydrogenation of ethane to ethylene at 823 K. The **catalysts** have been characterized with XRD, BET surface area measurements, XPS, TPR and NH₃ TPD techniques. Preparation method influences surface composition of the sample, formation of V⁵⁺ oxide being favored with respect to V⁴⁺ oxide for the **catalyst** prepared in two steps, whereas a comparable fraction of VOP₄ is formed on both samples. Results of **catalytic** tests suggests that the presence of V⁴⁺ strongly improves performances leading to higher ethylene yields.
- CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 45, 67
- ST ethane oxidative dehydrogenation **catalyst** titania supported **vanadium phosphate**
- IT Surface area
Surface composition
(of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- IT Dehydrogenation **catalysts**
(oxidative; effect of preparation technique on **catalytic** performances of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- IT 13463-67-7, **Titanium oxide (TiO₂)**,
uses
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(**catalyst support**; effect of preparation technique on **catalytic** performances of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- IT 1314-62-1, **Vanadium oxide (V₂O₅)**, uses 14542-94-0, **Vanadium phosphate**
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(effect of preparation technique on **catalytic** performances of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- IT 74-84-0, **Ethane**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of preparation technique on **catalytic** performances of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- IT 74-85-1P, **Ethylene**, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(effect of preparation technique on **catalytic** performances of TiO₂ supported **vanadium phosphate** in oxidative dehydrogenation of ethane)
- OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1

CITINGS)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 5 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2004:455704 HCAPLUS Full-text
DN 141:158890
TI Preparation of Novel Composite VPO/Fumed Silica
Catalyst for Partial Oxidation of n-Butane
AU Zhou, Z. Q.; Xu, H. Y.; Ji, W. J.; Chen, Y.
CS Key Laboratory of Mesoscopic Chemistry of the Ministry of Education,
Department of Chemistry, Nanjing University, Nanjing, 210093, Peop.
Rep. China
SO Catalysis Letters (2004), 96(3-4), 221-226
CODEN: CALEER; ISSN: 1011-372X
PB Kluwer Academic/Plenum Publishers
DT Journal
LA English
OS CASREACT 141:158890
AB A vanadyl phosphate (VPO)/fumed SiO₂ catalyst was prepared by
deposition-precipitation of (VO)₂P₂O₇ onto the SiO₂ support and the
catalyst was evaluated in partial oxidation of n-butane to maleic
anhydride. At 653-693 K the fumed SiO₂-based catalysts showed good
activity and maintained sufficiently high selectivity toward maleic
anhydride (MA) in comparison to conventional supported VPO catalysts
. The catalyst with 30% VPO content showed butane conversion of 60%
and MA selectivity of 58 mol% at 673 K. The turnover rates of low
loading catalyst was higher than that of high loading and unsupported
catalyst. The unique interaction between VPO and fumed SiO₂ and co-
existence of dominant (VO)₂P₂O₇ and minor VOPO₄ phases in non-
equilibrated catalysts favor MA formation. The presence of
poly(ethylene glycol) (PEG) in the preparation medium enhanced the
dispersion of VPO and consequently, the selectivity of the catalyst.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
ST vanadyl phosphate fumed silica support oxidn
catalyst prepn; butane partial oxidn maleic anhydride
vanadyl phosphate silica catalyst
IT Catalyst supports
(deposition-precipitation method in preparation of VPO/fumed
silica
catalyst with high activity in partial oxidation of n-butane
to maleic anhydride)
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deposition-precipitation method in preparation of VPO/fumed
silica

- catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT Oxidation **catalysts**
(partial; deposition-precipitation method in preparation of VPO /fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT Oxidation **catalysts**
(selective; deposition-precipitation method in preparation of VPO /fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 7631-86-9, Silica, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(amorphous, fume, partial oxidation **catalyst** support; deposition-precipitation method in preparation of VPO/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 108-31-6P, Maleic anhydride, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(deposition-precipitation method in preparation of VPO/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 106-97-8, n-Butane, reactions 1314-62-1, Vanadium oxide (V2O5), reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(deposition-precipitation method in preparation of VPO/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 25322-68-3, Poly(ethylene glycol)
RL: NUU (Other use, unclassified); USES (Uses)
(dispersant in **catalyst** precipitation; deposition-precipitation method in preparation of VPO/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 45021-28-1P 58834-75-6P, Vanadium oxide pyrophosphate (V2O2(P2O7))
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(partial oxidation **catalyst** containing; deposition-precipitation method in preparation of VPO/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)
- IT 12359-27-2P, Vanadyl phosphate
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic

preparation); PREP (Preparation); USES (Uses)

(partial oxidation **catalyst**; deposition-precipitation method in preparation of **VPO**/fumed silica **catalyst** with high activity in partial oxidation of n-butane to maleic anhydride)

OSC.G 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 6 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2004:424755 HCAPLUS Full-text

DN 141:125344

TI An XPS study of titania-supported vanadyl phosphate **catalysts** for the oxidative dehydrogenation of ethane

AU Casaletto, M. P.; Lisi, L.; Mattogno, G.; Patrono, P.; Ruoppolo, G.
CS CNR, Institute for the Study of Nanostructured Materials, Palermo, I-90146, Italy

SO Applied Catalysis, A: General (2004), 267(1-2), 157-164
CODEN: ACAGE4; ISSN: 0926-860X

PB Elsevier Science B.V.

DT Journal

LA English

AB The effect of thermal treatment and number of reaction cycles on activity of titania-supported vanadyl phosphate (VOPO4) **catalysts** in oxidative dehydrogenation (ODH) of ethane was studied using XPS. The surface characterization of monolayer (9.6%) and sub-monolayer (6.5%) VOPO4 samples was performed after calcination in air and after **catalytic** tests at different temps. (450 and 550°). Vanadyl phosphates are well dispersed on the TiO2 surface. The oxidation state, surface distribution, and evolution of vanadium and titanium species were analyzed by the V 2p3/2 and Ti 2p3/2 peak-fitting procedure. The interaction with the support leads to different **vanadium** species, V5+ **phosphate**, V5+ and V4+ oxide species, whose relative fraction depends on the nature of the support and on treatments. The amount of tetravalent vanadium species in the samples progressively increases with temperature. Surface modifications of the **titania support** were characterized by XPS after impregnation, calcination, and **catalytic** tests.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 67

ST vanadyl phosphate **catalyst** **titania**
support activity thermal treatment cycling; oxidative
dehydrogenation ethane vanadyl phosphate titania **catalyst**

IT Calcination

Surface composition

(effect of thermal treatment and reaction cycle number on activity of titania-supported vanadyl phosphate **catalysts** in

oxidative dehydrogenation of ethane)

IT Dehydrogenation **catalysts**
 (oxidative; effect of thermal treatment and reaction cycle number
 on activity of titania-supported vanadyl phosphate **catalysts**
 in oxidative dehydrogenation of ethane)

IT 7440-32-6, Titanium, uses 7440-62-2, Vanadium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (dehydrogenation **catalyst** containing; effect of thermal
 treatment and reaction cycle number on activity of titania-
 supported vanadyl phosphate **catalysts** in oxidative
 dehydrogenation of ethane)

IT 12359-27-2, Vanadium oxide phosphate (VO(PO₄))
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical,
 engineering or chemical process); PRP (Properties); PROC (Process);
 USES (Uses)
 (dehydrogenation **catalyst**; effect of thermal treatment
 and reaction cycle number on activity of titania-supported vanadyl
 phosphate **catalysts** in oxidative dehydrogenation of
 ethane)

IT 74-84-0, Ethane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (effect of thermal treatment and reaction cycle number on activity
 of titania-supported vanadyl phosphate **catalysts** in
 oxidative dehydrogenation of ethane)

IT 13463-67-7, Titania, processes
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical,
 engineering or chemical process); PRP (Properties); PROC (Process);
 USES (Uses)
 (support; effect of thermal treatment and reaction
 cycle number on activity of titania-supported vanadyl phosphate
catalysts in oxidative dehydrogenation of ethane)

OSC.G 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS RECORD (11
 CITINGS)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 7 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:722241 HCAPLUS Full-text
 DN 140:339077
 TI Preparation of 2-chloro-6-fluorobenzonitrile
 IN Zheng, Qiong; Li, Xiaoyun; Yu, Peng; Huang, Chi; Xie, Guangyong;
 Yang, Yuanqing; He, Xufeng
 PA Wuhan University, Peop. Rep. China; Wenbei Science and Technology
 Co., Ltd.
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 5 pp.

CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1379022	A	20021113	CN 2002-115744	20020423

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	CN 1133619	C	20040107	
PRAI	CN 2002-115744		20020423	<--

OS CASREACT 140:339077

AB 2-Chloro-6-fluorobenzonitrile is synthesized by gas-phase ammoxidn. of 2-chloro-6-fluorotoluene with NH₃ and air in the presence of **catalyst** at 623-723K. The molar ratio of air and NH₃ to 2-chloro-6-fluorotoluene is 8-60 and 2-12, resp. The **catalyst** is VPaCbDcEdOX/SiO₂ (C = Ti, Fe, Ni, Co, or Bi; D = Mn, Cr, Mo, Cu, Zn, or Sn; E = B, Na, K, Li, or Mg; a = 1, b = 0.5-2.5; c = 0.1-1.5; and d = 0.5-2.5).

IC ICM C07C255-50

ICS C07C253-24

CC 25-20 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 67

ST chlorofluorobenzonitrile prepn ammoxidn **catalyst**

IT Ammoxidation

(preparation of 2-chloro-6-fluorobenzonitrile)

IT Ammoxidation **catalysts**

(preparation of 2-chloro-6-fluorobenzonitrile by ammoxidn. of 2-chloro-6-fluorotoluene in presence of vanadium-phosphorus oxide)

IT 475504-34-8P, Vanadium oxide phosphate

(VO_{0.8}(PO₄)) 679842-58-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)

(preparation of 2-chloro-6-fluorobenzonitrile)

IT 668-45-1P, 2-Chloro-6-fluorobenzonitrile

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)

(preparation of 2-chloro-6-fluorobenzonitrile)

IT 443-83-4, 2-Chloro-6-fluorotoluene

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of 2-chloro-6-fluorobenzonitrile)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

(support; preparation of 2-chloro-6-fluorobenzonitrile)

L41 ANSWER 8 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:722207 HCAPLUS Full-text
 DN 140:339076
 TI Preparation and application of ammoxidation **catalyst** for
 preparing 2-chloro-6-fluorobenzonitrile
 IN Zheng, Qiong; Li, Xiaoyun; Yu, Peng; Huang, Chi; Xie, Guangyong;
 Yang, Yuanqing; He, Xufeng
 PA Wuhan Univ., Peop. Rep. China; Wuhan Wenbei Science and Technology
 Co., Ltd.
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 4 pp.
 CODEN: CNXXEV
 DT **Patent**
 LA Chinese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	CN 1378877	A	20021113	CN 2002-115745	200204 23

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CN 1132690 C 20031231
 PRAI CN 2002-115745 20020423 <--
 OS CASREACT 140:339076
 AB The title **catalyst** can be formulated by VP aCbDcEdOx/SiO₂, where C =
 Ti, Fe, Ni or Bi; D = Mn, Cr, Cu, Zn or Sn, E = B, Na, K, Li or Mg, a
 = 1, b = 0.5-2.5, c = 0.1-1.5, d = 0.5-2.5, e = 0.1-1.5, and x
 balances. The **catalyst** is prepared by impregnating the support with
 water-soluble precursor of active component, stewing, aging, and
 activating at 673-923 K for 2-20 h. The **catalyst** is highly active
 and selective in preparation of 2-chloro-6-fluorobenzonitrile by
 ammoxidn. of 2-chloro-6-fluorotoluene.
 IC ICM B01J027-198
 ICS C07C255-50; C07C253-24
 CC 25-20 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
 Section cross-reference(s): 67
 ST chlorofluorobenzonitrile prepn ammoxidn **catalyst**
 IT Ammoxidation **catalysts**
 (preparation and application of ammoxidn. **catalyst** for
 preparation of 2-chloro-6-fluorobenzonitrile)
 IT Silica gel, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support; preparation and application of ammoxidn.
catalyst for preparation of 2-chloro-6-fluorobenzonitrile)
 IT 475504-34-8P, Vanadium oxide **phosphate**
 (VO_{0.8}(PO₄)) 679842-58-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(preparation and application of ammoxidn. **catalyst** for preparation of 2-chloro-6-fluorobenzonitrile)

IT 668-45-1P, 2-Chloro-6-fluorobenzonitrile

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(preparation and application of ammoxidn. **catalyst** for preparation of 2-chloro-6-fluorobenzonitrile)

IT 443-83-4, 2-Chloro-6-fluorotoluene

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation and application of ammoxidn. **catalyst** for preparation of 2-chloro-6-fluorobenzonitrile)

L41 ANSWER 9 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2003:698035 HCAPLUS Full-text

DN 140:77432

TI Vanadyl phosphate dihydrate supported on oxides for the **catalytic** conversion of ethane to ethylene

AU Lisi, L.; Patrono, P.; Ruoppolo, G.

CS Istituto di Ricerche sulla Combustione, CNR, Naples, 80125, Italy

SO Journal of Molecular Catalysis A: Chemical (2003), 204-205, 609-616

CODEN: JMCCF2; ISSN: 1381-1169

PB Elsevier Science B.V.

DT Journal

LA English

AB VOP04·2H2O supported as a mono-layer on TiO2, Al2O3 and SiO2 and as a multi-layer on TiO2 was investigated for the oxidative dehydrogenation of ethane to ethylene in the temperature range 450-550°. The **catalysts** were characterized with X-ray diffraction patterns (XRD), BET surface area measurements and ESR and temperature programmed reduction (TPR) techniques comparing their properties to those of bulk VOP04·2H2O. TiO2 promotes the best dispersion of vanadyl phosphate for mono-layer **catalysts**, whereas the formation of VOP04 bulk-like particles was detected for SiO2 supported mono-layer **catalyst** or when the coverage far exceeds the mono-layer on TiO2. A fraction of vanadium is present as V(IV) in all **catalysts**, probably as VO(H2O)2+-O-P species. Reducibility of **vanadium phosphate** is enhanced by deposition on supports in extent depending on the strength of the interaction **support-active phase**, TiO2 mono-layer **catalyst** being the most reducible. The improvement of **catalytic** activity for supported **catalysts** has been related to the increase of both surface area and reducibility with respect to bulk VOP04. Ethylene selectivity increases with the temperature only for well dispersed samples due to a significant increase of V(IV) containing sites at 550° observed for these samples.

CC 35-2 (Chemistry of Synthetic High Polymers)
 ST vanadyl phosphate oxide **catalyst** conversion ethane
 ethylene
 IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12293-87-7,
 Vanadyl phosphate dihydrate 13463-67-7, Titania, uses
 RL: CAT (Catalyst use); USES (Uses)
 (Vanadyl phosphate dihydrate supported on oxides for the
catalytic conversion of ethane to ethylene)
 IT 74-84-0, Ethane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (Vanadyl phosphate dihydrate supported on oxides for the
catalytic conversion of ethane to ethylene)
 IT 74-85-1P, Ethylene, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (Vanadyl phosphate dihydrate supported on oxides for the
catalytic conversion of ethane to ethylene)
 OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3
 CITINGS)
 RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 10 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:313356 HCAPLUS Full-text
 DN 139:86955
 TI Comparative studies on the **VPO** specimen supported on
 mesoporous Al-containing MCM-41 and large-pore silica
 AU Nie, Weiyang; Wang, Zhongyu; Ji, Weijie; Chen, Yi; Au, C. T.
 CS Department of Chemistry, Laboratory of Mesoscopic Materials Science,
 Nanjing University, Nanjing, 210093, Peop. Rep. China
 SO Applied Catalysis, A: General (2003), 244(2), 265-272
 CODEN: ACAGE4; ISSN: 0926-860X
 PB Elsevier Science B.V.
 DT Journal
 LA English
 OS CASREACT 139:86955
 AB An Al-MCM-41 material was studied and compared with amorphous large-
 pore **silica**, as the **support** material for vanadium-phosphorus-oxide
 (**VPO**) **catalysts**. The support effects on the physico-chemical
 characteristics and the **catalytic** activity of **VPO catalysts** in
 selective oxidation of n-butane were studied. Differences in support
 composition and in **VPO** loading, physico-chemical properties of
 supported **VPO**, namely, surface area, pore size distribution, and
 structural features were identified, which have a marked influence on
catalyst performance. Compared with large-pore silica-**VPO**, the Al-
 MCM-41-**VPO catalyst** exhibited a notable enhancement in maleic
 anhydride (MA) selectivity and a slight decrease in n-butane
 conversion, due to interactions between **VPO** and Al-MCM-41 support.

Butane conversion increased with increasing vanadium loading, accompanied by a remarkable decrease in MA selectivity, likely due to increased number of sites that are more reactive but less selective. From a comparison of **catalyst** preparation methods, precipitation in organic medium was superior to acidic aqueous impregnation, and the unique structure of MCM-41 plays an important role on the physico-chemical properties of supported **VPO**.

- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 35, 67
- ST aluminum MCM41 zeolite support **vanadium phosphate catalyst**; surface area pore size zeolite support comparison **silica**
- IT Zeolite MCM-41
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(aluminum-containing, **catalyst** support; role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)
- IT **Catalyst** supports
Crystallinity
Pore size distribution
Surface area
(role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)
- IT Oxidation **catalysts**
(selective; role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)
- IT 108-31-6P, Maleic anhydride, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)
- IT 106-97-8, n-Butane, reactions 1302-42-7 6834-92-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)
- IT 65506-75-4, Vanadium phosphorus oxide
RL: CAT (Catalyst use); USES (Uses)
(selective oxidation **catalyst**; role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)

IT 57-09-0, Cetyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (zeolite preparation template; role of preparation method and structure of mesoporous Al-MCM-41 support on selectivity of **VPO catalyst** in selective oxidation of butane to maleic anhydride)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 11 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:26565 HCAPLUS Full-text
 DN 139:6649
 TI 3,4-Dichlorotoluene ammoxidation to 3,4-dichlorobenzonitrile over **VPO/SiO2 catalyst**
 AU Chi, Huang; Di, Xiao; Xu, Hai-xia; Zheng, Qiong; Chen, Yuan-yin
 CS College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China
 SO Wuhan University Journal of Natural Sciences (2002), 7(3), 353-355
 CODEN: WUNSFV; ISSN: 1007-1202
 PB Wuhan University
 DT Journal
 LA English
 OS CASREACT 139:6649
 AB Ammoxidn. of 3,4-dichlorotoluene (DCT) to prepare 3,4-dichlorobenzonitrile (DCBN) over silica supported vanadium phosphorus oxide **catalysts** has been studied. On the **VPO/SiO2 catalyst**, the influence of the reaction temperature, the molar ratio of air/DCT, the molar ratio of NH3/DCT in the feed gas and the space velocity (v5) on the conversion, yield and selectivity was observed. The most appropriate reaction condition is: reaction T=673 K, n(DCT): n(NH3): n(air)=1: 7: 30 and v5=250 h⁻¹. At this optimum reaction condition, the conversion of DCT is 97.8%; the molar yield of DCBN is 67.4%. The addition of elemental P can improve the yield of DCBN compared with VO/SiO2 **catalyst**.

CC 25-20 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds) Section cross-reference(s): 45

ST ammoxidn dichlorotoluene dichlorobenzonitrile vanadium phosphorus oxide silica **catalyst**

IT Ammoxidation
 Ammoxidation **catalysts**
 (ammoxidn. of dichlorotoluene to dichlorobenzonitrile over **VPO/SiO2 catalyst**)

IT **Catalysts**

(phosphorus promoters; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT Catalyst supports
(silica; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 95-75-0, 3,4-Dichlorotoluene
RL: RCT (Reactant); RACT (Reactant or reagent)
(ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 6574-99-8P, 3,4-Dichlorobenzonitrile
RL: SPN (Synthetic preparation); PREP (Preparation)
(ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 7723-14-0, Phosphorus, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst promoter; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 1314-62-1, Vanadium pentoxide, uses
RL: CAT (Catalyst use); USES (Uses)
(catalysts, with phosphoric acid; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 7664-38-2, Phosphoric acid, uses
RL: CAT (Catalyst use); USES (Uses)
(catalysts, with vanadium pentoxide; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

IT 7631-86-9, Silica, uses
RL: CAT (Catalyst use); USES (Uses)
(supports; ammoxidn. of dichlorotoluene to dichlorobenzonitrile over VPO/SiO₂ catalyst)

L41 ANSWER 12 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2002:924528 HCAPLUS Full-text
DN 137:371713
TI Manufacture of 3,4-dichlorobenzonitrile by catalytic
ammoxidation of 3,4-dichlorotoluene
IN Zheng, Qiong; Huang, Chi; Xie, Guangyong
PA Wuhan Univ., Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI CN 1328875 A 20020102 CN 2000-114641

200006
20

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CN 1137779 C 20040211
PRAI CN 2000-114641 20000620 <--
AB 3,4-Cl₂C₆H₃CN was manufactured by ammoxidn. of 3,4-Cl₂C₆H₃Me at 623-723°K with air in the presence of NH₃ (at resp. mol. ratio 1:2-12) by use of SiO₂-supported oxide **catalysts** VaPbQcDdEeO_x (Q = Ti, Mn, Cr, Mo, B; D = Fe, Ni, Co, Cu; E = Zn, K, Li, Mg, Sn; a = 1; b = 0.5-2.5; c = 0-1.3; d = 0-1.2; e = 0-0.4). The **catalysts** were prepared by impregnation of **silica** sol **support** and activation at 673-923°K for 2-20 h.
IC ICM C07K014-435
ICS C07K014-00; C07K016-18; C07K016-00; C07H021-00; C12N015-10; C12N015-11; C12N015-12; C12N015-63; B01J027-185; B01J027-195; B01J027-188; B01J027-187; B01J027-186; C07C255-50; C07C253-28
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 25, 67
ST chlorobenzonitrile manuf vanadium phosphorus metal oxide **catalyst**; ammonia dichlorotoluene oxidn vanadium phosphorus oxide **catalyst**; titanium vanadium phosphorus oxide oxidn **catalyst** dichlorobenzonitrile manuf
IT Ammoxidation **catalysts**
(silica-supported; manufacture of dichlorobenzonitrile by ammoxidn. of dichlorotoluene in presence of vanadium phosphorus oxide **catalysts**)
IT 475504-34-8, Vanadium phosphorus oxide [VPO₄.8] 475504-35-9, Titanium **vanadium** oxide **phosphate** (Ti_{0.8}VO_{1.7}(PO₄)_{1.2}) 475504-36-0, Iron vanadium metaphosphate oxide (Fe_{0.7}V(PO₃)_{2.4}O_{2.2}) 475504-37-1, **Vanadium** zinc oxide **phosphate** (VZn_{0.8}O_{2.15}(PO₄)_{0.7}) 475504-38-2 475504-39-3 475504-40-6 475504-41-7 475504-42-8 475504-43-9, Iron tin **vanadium** borate oxide **phosphate** (Fe_{0.8}Sn_{0.1}V(BO₃)_{0.1}O_{2.75}(PO₄)_{0.5})
RL: CAT (Catalyst use); USES (Uses)
(manufacture of dichlorobenzonitrile by ammoxidn. of dichlorotoluene in presence of vanadium phosphorus oxide **catalysts**)
IT 6574-99-8P, 3,4-Dichlorobenzonitrile
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of dichlorobenzonitrile by ammoxidn. of dichlorotoluene in presence of vanadium phosphorus oxide **catalysts**)
IT 7664-41-7, Ammonia, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)

(manufacture of dichlorobenzonitrile by ammoxidn. of
dichlorotoluene

in presence of vanadium phosphorus oxide **catalysts**)

IT 95-75-0, 3,4-Dichlorotoluene

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidation; manufacture of dichlorobenzonitrile by ammoxidn. of
dichlorotoluene in presence of vanadium phosphorus oxide
catalysts)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

(support; manufacture of dichlorobenzonitrile by ammoxidn.
of dichlorotoluene in presence of vanadium phosphorus oxide
catalysts)

L41 ANSWER 13 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2002:924527 HCAPLUS Full-text

DN 137:371712

TI Manufacture of 2,4-dichlorobenzonitrile by ammoxidation of
2,4-dichlorotoluene with vanadium titanium phosphorus oxide
catalysts

IN Zheng, Qiong; Huang, Chi; Xie, Guangyong

PA Wuhan Univ., Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.

CODEN: CNXXEV

DT ~~Patent~~

LA Chinese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	CN 1328874	A	20020102	CN 2000-114640	200006 20

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CN 1137778 C 20040211

PRAI CN 2000-114640 20000620 <--

AB 2,4-Cl₂C₆H₃CN was manufactured by ammoxidn. of 2,4-Cl₂C₆H₃Me in the
presence of highly active and selective oxide **catalysts** VaTibPcDdEeOx
(D = Ti, Fe, Ni, Co, Bi, Mo, Cr, Mo; E = Cu, Zn, Sn, B, K, Li, Mg; a
= 1; b = 0.3-2.5; c = 0.5-1.7; d = 0-1.2; e = 0-0.9, x = balance).
The **catalyst** was prepared by impregnating the silica sol carrier with
aqueous solns. of active components, aging, and activating at 300-
650° for 2-20 h.

IC ICM B01J027-14

ICS B01J027-185; B01J027-186; B01J027-199; C07C255-50; C07C253-24

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 25, 67

ST ammoxidn **catalyst** dichlorobenzonitrile manuf; vanadium
titanium phosphorus metal oxide **catalyst** dichlorotoluene
ammoxidn

IT Ammoxidation **catalysts**
(silica-supported; manufacture of dichlorobenzonitrile by
ammoxidn. of
dichlorotoluene with vanadium titanium phosphorus oxide
catalysts)

IT 475503-99-2, Titanium **vanadium** oxide **phosphate**
475504-00-8 475504-01-9 475504-02-0 475504-03-1 475504-04-2
RL: CAT (Catalyst use); USES (Uses)
(manufacture of dichlorobenzonitrile by ammoxidn. of
dichlorotoluene
with vanadium titanium phosphorus oxide **catalysts**)

IT 6574-98-7P, 2,4-Dichlorobenzonitrile
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of dichlorobenzonitrile by ammoxidn. of
dichlorotoluene
with vanadium titanium phosphorus oxide **catalysts**)

IT 95-73-8, 2,4-Dichlorotoluene
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of dichlorobenzonitrile by ammoxidn. of
dichlorotoluene
with vanadium titanium phosphorus oxide **catalysts**)

IT 7631-86-9, **Silica**, uses
RL: CAT (Catalyst use); USES (Uses)
(**support**; manufacture of dichlorobenzonitrile by ammoxidn.
of dichlorotoluene with vanadium titanium phosphorus oxide
catalysts)

L41 ANSWER 14 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2002:789122 HCAPLUS Full-text
DN 137:264705
TI **Catalysts** for p-anisonitrile preparation by ammoxidation
process
IN Xie, Guangyong; Zheng, Qiong; Huang, Chi
PA Wuhan Univ., Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.
CODEN: CNXXEV
DT **Patent**
LA Chinese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	CN 1318430	A	20011024	CN 2001-106634	200104

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CN 1112244 C 20030625
 PRAI CN 2001-106634 20010418 <--
 AB The **catalysts**, having high activity, selectivity and stability, contain silica gel (A) as carrier and VaPbMocDdEeOx as active component (B), wherein D=Ti, Fe, Ni, Co, Bi, Mn or Cr, E=Cu, Zn, Sn, B, K, Li or Mg, a=1, b=0.3-2.5, c=0.2-1.6, d=0-1.2, e=0-0.9, and x is the balance, and are prepared by impregnating A with aqueous solution of B, stirring, resting and activating at 673-923 K for 2-20 h.
 IC ICM B01J027-198
 ICS C07C255-54; C07C253-24
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67
 ST metal oxide complex ammoxidn **catalyst** anisonitrile prepn
 IT Ammoxidation
 Ammoxidation **catalysts**
 (preparation of **catalysts** for p-anisonitrile preparation through ammoxidn. process)
 IT 7631-86-9, **Silica**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**catalyst support**; in preparation of **catalysts** for p-anisonitrile preparation through ammoxidn. process)
 IT 1314-62-1, Vanadium pentoxide, reactions 7664-38-2, Phosphoric acid, reactions 10043-35-3, Boric acid, reactions 10361-44-1, Bismuth nitrate 12027-67-7, Ammonium molybdate ((NH₄)₆Mo₇O₂₄)
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in preparation of **catalysts** for p-anisonitrile preparation through ammoxidn. process)
 IT 104-93-8, p-Methoxytoluene
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in preparation of p-anisonitrile by ammoxidn. process)
 IT 874-90-8P, p-Anisonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation by ammoxidn. process from p-methoxytoluene)
 IT 462125-18-4P, Molybdenum **vanadium oxide phosphate** (MoVO₄(PO₄)) 462125-19-5P 462125-20-8P 462125-21-9P 462125-22-0P 462125-23-1P
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (silica-supported; preparation of **catalysts** for p-anisonitrile preparation through ammoxidn. process)
 L41 ANSWER 15 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2002:268113 HCAPLUS Full-text
 DN 137:203654

TI Propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica
 AU Marengo, S.; Patrono, P.; Comotti, P.; Galli, G.; Galli, P.; Massucci, M. A.; Meloni, M. T.
 CS Stazione Sperimentale per i Combustibili, San Donato Mil, Italy
 SO Applied Catalysis, A: General (2002), 230(1-2), 219-231
 CODEN: ACAGE4; ISSN: 0926-860X
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Mono-substituted M3+ compds. of vanadyl phosphate dihydrate $\text{VOPO}_4 \cdot 2\text{H}_2\text{O}$, with formula $[\text{M}(\text{H}_2\text{O})]_x\text{VO}_{1-x}\text{PO}_4 \cdot n\text{H}_2\text{O}$ ($\text{M}=\text{Al}, \text{Fe}, \text{Cr}$, $x=0.15-0.20$, $n=2-2.40$), and a di-substituted compound with formula $\text{Fe}_{0.08}\text{Cr}_{0.08}(\text{H}_2\text{O})_{0.16}\text{VO}_{0.84}\text{PO}_4 \cdot 2.9\text{H}_2\text{O}$, either pure or supported, were characterized by XRD, EDAX, TG/DTA, physisorption and chemisorption measurements, and tested as **catalysts** in the partial oxidation of propane. Incorporation of the M3+ cation into VOPO_4 produces a marked increase in surface area, pore volume, and reducibility, with subsequent enhancement of the **catalytic** activity. Upon adsorption of these compds. on titania, a homogeneous distribution of highly dispersed species is obtained, whereas on silica small conglomerates of crystalline phases of VOP and FeVOP are formed, presumably by polymerization on the acidic surface sites of the support. The titania-supported samples exhibit higher **catalytic** activity and better selectivity to partial oxidation products (acetic acid and propene), compared to silica-based materials; these effects are attributed to the higher dispersion and reducibility of the surface species. Propane oxidation over the supported materials undergoes transition to the ignited state, in which surface temps. up to 900 K are attained, and homogeneous reactions yield mainly propene and CO.
 CC 51-11 (Fossil Fuels, Derivatives, and Related Products)
 Section cross-reference(s): 45, 67
 ST partial oxidn propane trivalent cation substituted **vanadium phosphate catalyst; vanadium phosphate iron aluminum chromium cation substitution oxygenated product; mesopore distribution pore partial oxidn catalyst trivalent cation substituted**
 IT Pore
 (mesopore, of Fe- and Cr- substituted; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)
 IT Oxidation
 (partial; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)
 IT Pore size distribution
 Surface area
 (propane partial oxidation over M3+-substituted vanadyl phosphates

dispersed on titania and silica)

IT Cations
(trivalent; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 167750-37-0, Iron vanadium oxide phosphate
(Fe_{0.2}V_{0.8}O_{0.8}(PO₄)) 453547-19-8, Aluminum vanadium oxide phosphate (Al_{0.18}V_{0.82}O_{0.82}(PO₄))
RL: CAT (Catalyst use); USES (Uses)
(dihydrate, precursor; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 246226-81-3, Chromium iron vanadium oxide phosphate (Cr_{0.08}Fe_{0.08}V_{0.84}O_{0.84}(PO₄)) hydrate
453547-22-3
RL: CAT (Catalyst use); USES (Uses)
(precursor; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 79-10-7P, Acrylic acid, preparation 107-02-8P, Acrolein, preparation
RL: BYP (Byproduct); PREP (Preparation)
(propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 12359-27-2, Vanadyl phosphate
RL: CAT (Catalyst use); USES (Uses)
(propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 67-64-1, Acetone, formation (nonpreparative) 74-85-1, Ethene, formation (nonpreparative) 124-38-9, Carbon dioxide, formation (nonpreparative) 630-08-0, Carbon monoxide, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 64-19-7P, Acetic acid, preparation 115-07-1P, Propene, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 74-98-6, Propane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 7631-86-9, Silica, uses 13463-67-7, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(support; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

IT 12293-87-7, Vanadium oxide phosphate (VO(PO₄)),

dihydrate

RL: CAT (Catalyst use); USES (Uses)

(undoped precursor; propane partial oxidation over M3+-substituted vanadyl phosphates dispersed on titania and silica)

OSC.G 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 16 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2001:549476 HCAPLUS Full-text

DN 135:303468

TI Site isolation for light hydrocarbons oxidation

AU Volta, Jean-Claude

CS Institut de Recherches sur la Catalyse - CNRS, Villeurbanne, 69626, Fr.

SO Topics in Catalysis (2001), 15(2-4), 121-129
CODEN: TOCAFI; ISSN: 1022-5528

PB Kluwer Academic/Plenum Publishers

DT Journal; General Review

LA English

AB A review with refs. From consideration of several examples of **catalytic** oxide systems, it appears that the mild oxidation of light alkanes to oxygenates is controlled by the local properties of the surface of oxides which favor the isolation of the active cation or of a controlled number of active sites. This appears to be quite general on bulk mixed oxides as well as on supported oxides. Two examples are given for n-butane oxidation to maleic anhydride on the **VPO catalyst** and for ethane oxidation to acetic acid on the **VPMoO/TiO₂ catalyst**. This conclusion was reached by using several physicochem. techniques which are complementary and may distinguish the surface and the bulk properties of the **catalytic** oxides. As a consequence, the improvement of the performance of a **catalytic** oxide system and the discovery of new generation of **catalysts** will stem from the modification at short distance of the local environment of the active site.

CC 22-0 (Physical Organic Chemistry)
Section cross-reference(s): 35, 45, 67

ST site isolation hydrocarbon oxidn review; butane oxidn maleic anhydride vanadyl pyrophosphate review; ethane oxidn acetic acid vanadium phosphorus molybdenum oxide review

IT Oxidation
Oxidation **catalysts**

(Site isolation for light hydrocarbons oxidation)

IT Valence

(site isolation for light hydrocarbon oxidation)

IT Hydrocarbons, reactions

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (site isolation for light hydrocarbon oxidation)

IT Oxidation
 (surface; Site isolation for light hydrocarbons oxidation)

IT Reaction mechanism
 (surface; site isolation for light hydrocarbon oxidation)

IT 14542-94-0, **Vanadium phosphate** 25013-42-7,
 Molybdenum phosphate 58834-75-6, Vanadyl pyrophosphate
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (Site isolation for light hydrocarbons oxidation)

IT 74-84-0, Ethane, reactions 106-97-8, Butane, reactions
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (Site isolation for light hydrocarbons oxidation)

IT 64-19-7P, Acetic acid, preparation 108-31-6P, Maleic anhydride, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (Site isolation for light hydrocarbons oxidation)

IT 13463-67-7, **Titania**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (anatase, **catalyst support**; Site isolation for light hydrocarbons oxidation)

OSC.G 24 THERE ARE 24 CAPLUS RECORDS THAT CITE THIS RECORD (25 CITINGS)

RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 17 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2000:741016 HCAPLUS Full-text

DN 133:282204

TI Redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene

IN Stahl, Anni; Blom, Niels Jorgen; Perregaard, Jens; Nielsen, Poul Erik Hojlund

PA Haldor Topsoe A/S, Den.

SO Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	EP 1044949	A1	20001018	EP 2000-105498	

				200003 15
			<--	
EP 1044949	B1	20040303		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, LT, LV, FI, RO				
DK 9900477	A	20001013	DK 1999-477	
				199904 12
			<--	
AT 260878	T	20040315	AT 2000-105498	
				200003 15
			<--	
ES 2216746	T3	20041101	ES 2000-105498	
				200003 15
			<--	
CA 2302074	A1	20001012	CA 2000-2302074	
				200003 27
			<--	
CA 2302074	C	20081216		
US 6326523	B1	20011204	US 2000-536582	
				200003 28
			<--	
AU 766556	B2	20031016	AU 2000-27629	
				200004 10
			<--	
NO 2000001874	A	20001013	NO 2000-1874	
				200004 11
			<--	
NO 326149	B1	20081006		
RU 2231517	C2	20040627	RU 2000-108719	
				200004 11
			<--	
JP 2000297048	A	20001024	JP 2000-110707	
				200004 12
			<--	
CN 1272481	A	20001108	CN 2000-106573	
				200004 12

<--

CN 1179930 C 20041215
 MX 2000003554 A 20020201 MX 2000-3554

200004
 12

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PRAI DK 1999-477 A 19990412 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The dehydrogenation of a hydrocarbon feed into an alkene (e.g., propene) is achieved in high yield and selectivity by: dehydrogenating the hydrocarbon feed (e.g., propane); and removing hydrogen being formed by the dehydrogenation reactions. The dehydrogenation and hydrogen removal steps are performed simultaneously in the presence of a dehydrogenation **catalyst** (e.g., silica-coated **vanadium phosphate**) comprising a metal compound being reduced in the presence of hydrogen.

IC ICM C07C005-42

CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 23, 48, 67

ST propane dehydrogenation propene manuf; propylene manuf propane dehydrogenation; **catalyst** dehydrogenation redox alkane conversion alkene

IT Redox reaction **catalysts**
 (dehydrogenative; metal oxides or phosphates in the dehydrogenation of a hydrocarbon feed into an alkene)

IT Redox reaction
 (in the dehydrogenation of a hydrocarbon feed into an alkene)

IT Dehydrogenation **catalysts**
 (metal oxides and phosphates for the dehydrogenation of a hydrocarbon into an alkene)

IT Dehydrogenation
 (of a hydrocarbon into an alkene)

IT Oxides (inorganic), reactions
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT Hydrocarbons, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon into an alkene)

IT 7664-38-2D, Phosphoric acid, redox-capable metal salts, reactions
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (**catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT 1333-74-0P, Hydrogen, preparation 11098-99-0P, Molybdenum oxide

14542-94-0P, **Vanadium phosphate**
 RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT 7440-47-3, Chromium, reactions
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT 115-07-1P, Propene, preparation 115-11-7P, Isobutene, preparation
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**support**; redox process and **catalysts** for the dehydrogenation of a hydrocarbon feed into an alkene)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 18 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2000:637981 HCAPLUS Full-text
 DN 134:193763
 TI **Vanadium phosphate** supported **catalysts** for ethane oxidative dehydrogenation
 AU Ciambelli, Paolo; Lisi, Luciana; Ruoppolo, Giovanna; Patrono, Pasquale; Galli, Paola; Pirone, Raffaele; Russo, Gennaro
 CS Dipartimento di Ingegneria Chimica e Alimentare, Universita di Salerno, Fisciano, 84084, Italy
 SO Phosphorus Research Bulletin (1999), 10, 424-429
 CODEN: PREBE7; ISSN: 0918-4783
 PB Japanese Association of Inorganic Phosphorus Chemistry
 DT Journal
 LA English
 AB TiO₂- and Al₂O₃-supported VOP₄ was studied as **catalyst** for the oxidative dehydrogenation of ethane in the temperature range 450-550°C. The **catalytic** performances were dramatically enhanced with respect to bulk VOP₄ as result of modified redox properties.

Catalytic activity and selectivity to ethylene are associated to the presence of reduced vanadium, whose formation occurs during the reaction and is favored by high temperature

CC 35-2 (Chemistry of Synthetic High Polymers)

ST vanadium phosphate catalyst ethane oxidative dehydrogenation; ethylene prepn catalyst vanadium phosphate; titania supported vanadium catalyst ethane dehydrogenation; alumina supported vanadium catalyst ethane dehydrogenation

IT Dehydrogenation catalysts
(oxidative; alumina- and titania-supported vanadium phosphate catalyst for oxidative dehydrogenation of ethane)

IT 74-84-0, Ethane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(alumina- and titania-supported vanadium phosphate catalyst for oxidative dehydrogenation of ethane)

IT 74-85-1P, Ethylene, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(alumina- and titania-supported vanadium phosphate catalyst for oxidative dehydrogenation of ethane)

IT 12359-27-2, Vanadyl phosphate
RL: CAT (Catalyst use); USES (Uses)
(catalysts; alumina- and titania-supported vanadium phosphate catalyst for oxidative dehydrogenation of ethane)

IT 1344-28-1, Alumina, uses 13463-67-7, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(supports; alumina- and titania-supported vanadium phosphate catalyst for oxidative dehydrogenation of ethane)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 19 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2000:584626 HCAPLUS Full-text

DN 133:350534

TI TiO₂ supported vanadyl phosphate as catalyst for oxidative dehydrogenation of ethane to ethylene

AU Ciambelli, P.; Galli, P.; Lisi, L.; Massucci, M. A.; Patrono, P.; Pirone, R.; Ruoppolo, G.; Russo, G.

CS Dipartimento di Ingegneria Chimica e Alimentare, Universita di

Salerno, Fisciano (SA), 84084, Italy

SO Applied Catalysis, A: General (2000), 203(1), 133-142
CODEN: ACAGE4; ISSN: 0926-860X

PB Elsevier Science B.V.

DT Journal

LA English

AB Bulk and TiO₂-supported VOPO₄ has been investigated for the oxidative dehydrogenation of ethane. XRD, SEM, and TG analyses and BET surface area measurements indicated that vanadyl phosphate is highly dispersed on the support up to monolayer coverage. A fraction of vanadium is present as V(IV) in the calcined samples as evaluated by EPR and TPR techniques. Both reducibility and acidity of **vanadium phosphate** is strongly enhanced by deposition on TiO₂ with respect to the bulk phase, as shown by TPR and NH₃ TPD technique, resp. The supported **catalysts** are active and selective in the oxidative dehydrogenation of ethane to ethylene in the temperature range 450-550°C, the monolayer **catalyst** giving the best performances. Ethylene selectivity decreases with increasing contact time but increases with temperature. The former effect indicates that ethylene is further oxidized to CO_x at high contact times. The effect of the temperature was attributed to the formation of V(IV), favored at increasing temperature. This hypothesis was supported by TPR expts. carried out after **catalytic** tests at 550°C that indicated a significant increase of the fraction of V(IV) after the reaction.

CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67

ST ethane oxidative dehydrogenation ethylene prodn; vanadyl phosphate
titania **catalyst**

IT Dehydrogenation **catalysts**
(oxidative; supported **catalysts** for oxidative dehydrogenation of ethane to ethene)

IT 12293-87-7, Vanadyl phosphate dihydrate
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for oxidative dehydrogenation of ethane to ethylene)

IT 74-84-0, Ethane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalysts** for oxidative dehydrogenation of ethane to ethylene)

IT 13463-67-7, Titanium dioxide, uses
RL: CAT (Catalyst use); USES (Uses)
(**support** for **catalyst** for oxidative dehydrogenation of ethane to ethylene)

IT 74-85-1, Ethylene, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(supported **catalysts** for oxidative dehydrogenation of ethane to)

OSC.G 30 THERE ARE 30 CAPLUS RECORDS THAT CITE THIS RECORD (30 CITINGS)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 20 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2000:565427 HCAPLUS Full-text

DN 134:117437

TI Molecular structure-reactivity relationships in n-butane oxidation over bulk VPO and supported vanadia catalysts: lessons for molecular engineering of new selective catalysts for alkane oxidation

AU Guliants, V. V.; Benziger, J. B.; Sundaresan, S.; Wachs, I. E.

CS Department of Chemical Engineering, University of Cincinnati, Cincinnati, OH, 45221-0171, USA

SO Studies in Surface Science and Catalysis (2000), 130B(International Congress on Catalysis, 2000, Pt. B), 1721-1726
CODEN: SSCTDM; ISSN: 0167-2991

PB Elsevier Science B.V.

DT Journal

LA English

AB The promoter effects of ethanol, Si, Ti, Zr, V, and Nb on bulk vanadyl pyrophosphate, (VO₂)P₂O₇ (VPO) and supported vanadia catalysts were studied in partial oxidation of n-butane to maleic anhydride. The supported vanadia catalysts were prepared by the incipient-wetness impregnation of metal oxide supports (SiO₂, TiO₂, ZrO₂, Nb₂O₃, and Al₂O₃) with vanadium isopropoxide solution in methanol. No correlation was found between the electronegativity of the promoter or oxide cation support and the catalytic activity and selectivity. Enhancement of the surface acidity had a beneficial effect on both the oxidation rate of n-butane and the selectivity toward maleic anhydride, over those of bulk VPO and supported vanadia catalysts. The activation of n-butane on both the bulk and supported vanadia catalysts requires both a redox site and an acid site. The supported vanadia catalysts represent a suitable model for bulk VPO catalysts.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

ST vanadyl pyrophosphate catalyst silicon niobium promoter effect; butane partial oxidn vanadyl pyrophosphate catalyst selectivity; vanadia metal oxide supported catalyst surface acidity; maleic anhydride manuf butane oxidn vanadium catalyst

IT Impregnation
(incipient-wetness; promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)

- IT Catalyst supports
Electronegativity
Oxidation catalysts
Oxidation kinetics
Surface acidity
(promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 36139-34-1, Vanadium isopropoxide
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst precursor; promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 1314-23-4, Zirconium oxide (ZrO₂),
uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12059-63-1, Niobium oxide (Nb₂O₃)
13463-67-7, Titanium oxide (TiO₂),
uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 1314-62-1, Vanadia, uses 58834-75-6, Vanadium oxide pyrophosphate (VO₂(P₂O₇))
RL: CAT (Catalyst use); USES (Uses)
(promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 108-31-6P, Maleic anhydride, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 106-97-8, n-Butane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- IT 64-17-5, Ethanol, uses 7440-03-1, Niobium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses
RL: CAT (Catalyst use); USES (Uses)
(promoter; promoter and support effects on surface acidity and selectivity of VPO and vanadia catalysts in n-butane oxidation to maleic anhydride)
- OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1

CITINGS)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 21 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2000:114941 HCAPLUS Full-text
DN 132:295343
TI Investigation of sol-gel methods for the synthesis of **VPO**
membrane materials adapted to the partial oxidation of n-butane
AU Farrusseng, D.; Julbe, A.; Lopez, M.; Guizard, C.
CS ENSCM, UMR CNRS 5635, Laboratoire des Materiaux et Procédés
Membranaires, Montpellier, 34 296, Fr.
SO Catalysis Today (2000), 56(1-3), 211-220
CODEN: CATTEA; ISSN: 0920-5861
PB Elsevier Science B.V.
DT Journal
LA English
AB The sol-gel process was used to prepare supported **vanadium phosphate**
(**VPO**) membranes adapted to the mild oxidation of n-butane to maleic
anhydride in a membrane reactor. Starting from a vanadium
oxoalkoxide, two different sol-gel methods have been investigated:
the colloidal route in aqueous media and the polymeric route in
organic media. The membrane synthesis as well as the characteristics
of the **VPO** precursors are described on the basis of the fundamental
phenomena occurring during the sol-gel process. The **VPO** precursors
and the derived **catalysts** were characterized through TGA, elemental
anal., LRS, XRD and N₂ adsorption-desorption. The polymeric route
yielded an attractive hybrid organic-inorg. **VPO** precursor adapted to
the synthesis of infiltrated **VPO**/ α -Al₂O₃ composite membranes stable
up to 500°C. N₂ permeation expts. were used to characterize the
membranes after n-C₄H₁₀ and O₂ heat-treatment cycles. Gravimetric
anal. were useful to correlate the structural characteristics and
permeation behavior of the **VPO** membranes after n-C₄H₁₀ or O₂
treatments.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
ST vanadyl phosphate alumina supported membrane butane oxidn maleic
anhydride
IT Oxidation **catalysts**
(partial; sol-gel methods for the synthesis of **vanadium**
phosphate membrane materials adapted to the partial
oxidation of n-butane to maleic anhydride)
IT Permeability
(sol-gel methods for the synthesis of **vanadium**
phosphate membrane materials adapted to the partial
oxidation of n-butane to maleic anhydride)
IT Membranes, nonbiological

(supported; sol-gel methods for the synthesis of **vanadium phosphate** membrane materials adapted to the partial oxidation of n-butane to maleic anhydride)

IT 1344-28-1, **Alumina**, uses
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (membrane **support**; sol-gel methods for the synthesis of **vanadium phosphate** membrane materials adapted to the partial oxidation of n-butane to maleic anhydride)

IT 12359-27-2, Vanadyl phosphate (VOP04) 58834-75-6, Vanadyl pyrophosphate (VO)2P2O7
 RL: CAT (Catalyst use); USES (Uses)
 (sol-gel methods for the synthesis of **vanadium phosphate** membrane materials adapted to the partial oxidation of n-butane to maleic anhydride)

IT 108-31-6P, 2,5-Furandione, preparation
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
 (sol-gel methods for the synthesis of **vanadium phosphate** membrane materials adapted to the partial oxidation of n-butane to maleic anhydride)

IT 106-97-8, Butane, reactions 1804-93-9, Dipropyl phosphate 7664-38-2, Phosphoric acid, reactions 264921-17-7
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sol-gel methods for the synthesis of **vanadium phosphate** membrane materials adapted to the partial oxidation of n-butane to maleic anhydride)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

L41 ANSWER 22 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1999:765441 HCAPLUS Full-text
 DN 132:65695
 TI Effect of promoters for n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide **catalysts**: comparison with supported vanadia **catalysts**
 AU Guliants, V. V.; Benziger, J. B.; Sundaresan, S.; Wachs, I. E.; Hirt, A. M.
 CS Department of Chemical Engineering, University of Cincinnati, Cincinnati, OH, 45221-0171, USA
 SO Catalysis Letters (1999), 62(2-4), 87-91
 CODEN: CALEER; ISSN: 1011-372X
 PB Baltzer Science Publishers
 DT Journal
 LA English
 AB The oxidation of n-butane to maleic anhydride was studied over model Nb-, Si-, Ti-, V-, and Zr-promoted bulk vanadium-phosphorus-oxide [VPO] and supported vanadia **catalysts**. The promoters were

concentrated in the surface region of the bulk VPO catalysts. For the supported vanadia catalysts, the vanadia phase was present as a two-dimensional metal oxide overlayer on the different oxide supports (TiO₂, ZrO₂, Nb₂O₅, Al₂O₃, and SiO₂). No correlation was found between the electronegativity of the promoter or oxide support cation and the catalytic properties of these two catalytic systems. The maleic anhydride selectivity correlated with the Lewis acidity of the promoter cations and oxide supports. Both promoted bulk VPO and supported vanadia catalysts containing surface niobia species were the most active and selective to maleic anhydride. These findings suggest that the activation of n-butane on both the bulk and supported vanadia catalysts probably requires both surface redox and acid sites, and that the acidity also plays an important role in controlling further kinetic steps of n-butane oxidation

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

ST butane oxidn vanadium phosphorus oxide catalyst; vanadia catalyst butane oxidn metal oxide support; maleic anhydride manuf butane oxidn vanadia catalyst

IT Catalyst supports
Electronegativity
Lewis acidity
Oxidation
Oxidation catalysts

(effect of metal promoters on n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide catalysts)

IT 7440-03-1, Niobium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst promoter; effect of metal promoters on n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide catalysts)

IT 1313-96-8, Niobium oxide (Nb₂O₅) 1314-23-4, Zirconium oxide (ZrO₂), uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 13463-67-7, Titanium oxide (TiO₂), uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst support; effect of metal promoters on n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide catalysts)

IT 108-31-6P, Maleic anhydride, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
(effect of metal promoters on n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide catalysts)

IT 106-97-8, n-Butane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of metal promoters on n-butane oxidation to maleic anhydride
over vanadium-phosphorus-oxide catalysts)

IT 1314-62-1, Vanadia, uses 65506-75-4, Vanadium phosphorus oxide
RL: CAT (Catalyst use); USES (Uses)
(oxidation catalyst; effect of metal promoters on n-butane oxidation to maleic anhydride over vanadium-phosphorus-oxide catalysts)

OSC.G 8 THERE ARE 8 CAPLUS RECORDS THAT CITE THIS RECORD (8 CITINGS)

RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 23 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1999:750866 HCAPLUS Full-text
DN 132:24106
TI Sol-gel synthesis and catalytic properties of vanadium phosphates
AU Ennaciri, Sidi Abdelrazak; Malka, Karen; Louis, Catherine; Barboux, Philippe; R'Kha, Chakib; Livage, Jacques
CS Departement de Chimie, Universite Cadi Ayyad-Semlalia, Marrakech, Morocco
SO Catalysis Letters (1999), 62(1), 79-85
CODEN: CALEER; ISSN: 1011-372X
PB Baltzer Science Publishers
DT Journal
LA English
AB Vanadyl phosphates with variable sp. surface areas were prepared from V alkoxides and H3PO4 by precipitation in various solvents. The catalytic properties were studied for MeOH oxidation. Although the specific activity increases with sp. surface area, the intrinsic activities seem to depend on the particle morphol. The selectivities do not vary within a large range. The same method of precipitation was applied to prepare vanadyl phosphates on silica support. The supported phase is highly dispersed, and these supported catalysts are more stable than silica-supported V2O5.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

ST methanol oxidn vanadyl phosphate catalyst; methyl formate prepn methanol oxidn catalyst

IT Oxidation catalysts
(catalytic properties of vanadyl phosphate catalysts for MeOH oxidation)

IT 61164-11-2, Vanadium oxide phosphate
RL: CAT (Catalyst use); USES (Uses)

(catalytic properties of vanadyl phosphate
catalysts for MeOH oxidation)

IT 67-56-1, Methanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalytic properties of vanadyl phosphate
catalysts for MeOH oxidation)

IT 107-31-3, Methyl formate
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalytic properties of vanadyl phosphate
catalysts for MeOH oxidation to)

OSC.G 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5
CITINGS)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 24 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1999:460382 HCAPLUS Full-text
DN 131:89350
TI Production of formaldehyde using carbon oxides, hydrogen and
hydrogen sulfide
IN Wachs, Israel E.
PA Lehigh University, USA
SO PCT Int. Appl., 41 pp.
CODEN: PIXXD2
DT ~~Patent~~
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9933778	A1	19990708	WO 1998-US27411	199812 23

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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ,
DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN,
IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD,
MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,
SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 6084135 A 20000704 US 1998-216843

199812
21

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CA 2316810 A1 19990708 CA 1998-2316810

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AU 9919439 A 19990719 AU 1999-19439

199812
23

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GB 2347929 A 20000920 GB 2000-16227

199812
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GB 2347929 B 20021231
 PRAI US 1997-70113P P 19971231 <--
 WO 1998-US27411 W 19981223 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A gas stream containing H, C oxide and H₂S is (a) passed in contact with a **catalyst** comprising a porous alumina-supported sulfided metal selected from Mo, Cr, W, Mn, Ni, Fe, Zn, Co, Cu, Sn, V and mixts., optionally promoted by an alkali metal sulfide, to convert the H, C oxide and H₂S to Me mercaptans, (primarily methanethiol, MeSH), and (b) the gas stream containing the Me mercaptans are passed in contact with a **catalyst** comprising a supported metal oxide or a bulk metal oxide in the presence of an oxidizing agent to convert at least a portion of the Me mercaptan to CH₂O, and SO₂. In step b, oxidation of MeSH over vanadia (1%) on titania **catalyst** at 150-450° to produce CH₂O, showed maximum selectivity to CH₂O at .apprx.400°.

IC ICM C07C045-49
 ICS C07C045-27; C07C045-32; C07C047-04; C07C319-02

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

ST formaldehyde prepn methyl mercaptan intermediate; hydrogen sulfide carbon oxide reaction mixt; transition metal sulfide **catalyst** mercaptan prepn; alkali metal sulfide **catalyst** mercaptan prepn; oxidn methyl mercaptan formaldehyde; metal oxide oxidn **catalyst** methanethiol

IT Oxidation **catalysts**
 (methanethiol oxidation in presence of supported)

IT 7446-09-5P, Sulfur dioxide, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (byproduct; methanethiol oxidation in presence of metal oxide)

IT 229620-63-7, Bismuth iron molybdenum oxide (Bi₃FeMo₃O₁₆)
 RL: CAT (Catalyst use); USES (Uses)
 (ceramic; methanethiol oxidation in presence of supported)

IT 50-00-0P, Formaldehyde, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (methanethiol oxidation in presence of metal oxide)

IT 74-93-1, Methanethiol, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)

(methanethiol oxidation in presence of metal oxide)

IT 1313-13-9, Manganese oxide (MnO₂), uses 1317-34-6, Manganese oxide (Mn₂O₃) 1317-35-7, Manganese oxide (Mn₃O₄) 1344-43-0, Manganous oxide, uses 7631-95-0, Sodium molybdate (Na₂MoO₄) 7722-64-7, Potassium permanganate 7775-11-3, Sodium chromate (Na₂CrO₄) 7778-50-9, Potassium dichromate (K₂Cr₂O₇) 7787-42-0, Barium tungstate (BaWO₄) 7789-00-6 7789-82-4, Calcium molybdate (CaMoO₄) 7790-60-5, Potassium tungstate (K₂WO₄) 7790-75-2, Calcium tungstate (CaWO₄) 10099-79-3, Lead vanadium oxide (PbV₂O₆) 10101-58-3, Cobalt tungsten oxide (CoWO₄) 10190-55-3, Lead molybdenum oxide (PbMoO₄) 10294-52-7, Iron chromate (Fe₂(CrO₄)₃) 10588-01-9 12009-63-1, Barium titanate (Ba₂TiO₄) 12013-45-5, Calcium niobium oxide CaNb₂O₆ 12030-85-2, Potassium niobate (KNbO₃) 12031-11-7, Potassium niobium oxide K₈Nb₆O₁₉ 12031-63-9, Lithium niobate (LiNbO₃) 12034-09-2, Sodium niobate (NaNbO₃) 12034-34-3, Sodium titanate (Na₂TiO₃) 12034-61-6, Niobium yttrium oxide (NbY₂O₄) 12034-62-7, Niobium ytterbium oxide (NbYbO₄) 12047-27-7, Barium titanate (BaTiO₃), uses 12068-52-9, Aluminum manganese oxide (Al₂MnO₄) 12142-45-9, Potassium niobate (K₄Nb₆O₁₇) 12258-25-2, Aluminum niobium oxide AlNbO₄ 12272-28-5, Bismuth niobium oxide (BiNbO₄) 12359-27-2, Vanadium oxide phosphate (VO(PO₄)) 12422-53-6, Potassium chromate K₂Cr₄O₁₃ 12436-50-9, Iron tungstate (Fe₂(WO₄)₃) 13451-05-3, Strontium tungstate (SrWO₄) 13454-78-9, Cesium chromate (Cs₂CrO₄) 13466-16-5, Sodium molybdate (Na₂Mo₂O₇) 13472-33-8, Sodium perrhenate 13472-45-2 13530-56-8, Aluminum vanadium oxide (AlVO₄) 13568-45-1, Lithium tungstate (Li₂WO₄) 13568-63-3, Magnesium vanadate (Mg₂V₂O₇) 13568-68-8, Magnesium vanadate (Mg₃(VO₄)₂) 13587-19-4, Cesium tungstate (Cs₂WO₄) 13587-35-4, Copper tungsten oxide (CuWO₄) 13597-19-8, Cerium vanadium oxide (CeVO₄) 13718-26-8, Sodium vanadate (NaVO₃) 13721-35-2, Sodium tungstate (Na₂W₂O₇) 13721-39-6, Sodium vanadate (Na₃VO₄) 13762-14-6, Cobalt molybdenum oxide (CoMoO₄) 13765-19-0, Calcium chromate (CaCrO₄) 13767-03-8, Magnesium molybdate (MgMoO₄) 13767-34-5, Copper molybdenum oxide (CuMoO₄) 13768-48-4, Lithium rhenium oxide (LiReO₄) 13768-50-8, Magnesium rhenate (Mg(ReO₄)₂) 13769-43-2, Potassium vanadate (KVO₃) 13870-24-1, Iron tungsten oxide (FeWO₄) 13977-56-5, Iron vanadium oxide (FeVO₄) 14013-15-1, Manganese molybdenum oxide (MnMoO₄) 14059-33-7, Bismuth vanadium oxide (BiVO₄) 14177-46-9, Manganese tungsten oxide MnWO₄ 14177-51-6, Nickel tungsten oxide NiWO₄ 14177-55-0, Nickel molybdenum oxide NiMoO₄ 14929-64-7, Sodium chromate (Na₂Cr₄O₁₃) 14985-14-9, Gadolinium molybdate (Gd₂(MoO₄)₃) 15123-80-5, Aluminum molybdate Al₂(MoO₄)₃ 15123-82-7, Aluminum tungstate (Al₂(WO₄)₃) 15469-60-0, Zinc vanadate (Zn₃(VO₄)₂) 15578-31-1, Vanadium zinc oxide (V₂Zn₂O₇) 15586-37-5, Chromium molybdate (Cr₂(MoO₄)₃) 15593-35-8, Niobium oxide phosphate

(NbO(PO₄)) 15971-52-5, Potassium chromate (K₂Cr₃O₁₀) 16229-40-6,
 Bismuth molybdenum oxide (Bi₂Mo₂O₉) 16872-61-0, Lead vanadium
 oxide (Pb₂V₂O₇) 17622-84-3, Cadmium vanadate (Cd₂V₂O₇)
 19402-39-2, Lithium tungstate (Li₆WO₆) 22470-36-6, Thallium
 vanadium oxide (TlVO₄) 29992-43-6, Cesium lutetium tungsten oxide
 CsLuW₂O₈ 35600-19-2, Antimony niobium oxide (SbNbO₄) 55127-58-7,
 Molybdenum tellurium oxide (MoTe₂O₇) 80487-87-2, Calcium niobium
 potassium oxide (Ca₂Nb₃KO₁₀) 100154-26-5, Sodium chromate
 (Na₂Cr₃O₁₀) 222834-02-8, Bismuth tungsten oxide (BiWO₄)
 222834-06-2, Bismuth chromium oxide (BiCrO₄) 223650-70-2
 RL: CAT (Catalyst use); USES (Uses)

(methanethiol oxidation in presence of supported)

IT 1344-28-1, **Alumina**, uses 7631-86-9, **Silica**,
 uses

RL: CAT (Catalyst use); USES (Uses)

(**support**; methanethiol oxidation in presence of)

IT 1313-27-5, Molybdenum trioxide, uses 1313-96-8, Niobium oxide
 (Nb₂O₅) 1314-23-4, **Zirconia**, uses 1314-35-8, Tungsten
 oxide WO₃, uses 13463-67-7, **Titania**, uses

RL: CAT (Catalyst use); USES (Uses)

(supported and **support**; methanethiol oxidation in presence
 of)

IT 1308-38-9, **Chromia**, uses 1314-61-0, Tantalum oxide 1314-62-1,
 Vanadia, uses 1314-68-7, Rhenium oxide Re₂O₇ 11129-60-5,
 Manganese oxide 13769-81-8, Iron molybdate Fe₂(MoO₄)₃

RL: CAT (Catalyst use); USES (Uses)

(supported; methanethiol oxidation in presence of)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2
 CITINGS)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 25 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1998:802746 HCAPLUS Full-text

DN 130:125425

TI The selective oxidation of n-butane to maleic anhydride: comparison
 of bulk and supported V-P-O **catalysts**

AU Ruitenbeek, M.; Van Dillen, A. J.; Barbon, A.; Van Faassen, E. E.;
 Koningsberger, D. C.; Geus, J. W.

CS Debye Institute, Department of Inorganic Chemistry and Catalysis,
 Utrecht University, Utrecht, 3508 TB, Neth.

SO Catalysis Letters (1998), 55(3,4), 133-139

CODEN: CALEER; ISSN: 1011-372X

PB Baltzer Science Publishers

DT Journal

LA English

AB V-P-O **catalysts** supported on the surface of silica and titania particles were studied and compared with bulk V-P-O. The **catalytic** performance was tested in the n-butane oxidation reaction to maleic anhydride, and the structure of the equilibrated **catalysts** was characterized with X-ray absorption spectroscopy (EXAFS) and (low-temperature) ESR spectroscopy. Our results show considerable differences in **catalytic** performance between VPO/TiO₂ on the one hand, and VPO/SiO₂ and VPO/bulk on the other hand, the yield to maleic anhydride being comparable for VPO/bulk and VPO /SiO₂. The differences in **catalytic** behavior are attributed to differences in the local structure around vanadium (EXAFS). Furthermore, different spin exchange interactions between vanadium atoms in the three samples have been observed (ESR). The combination of characterization methods suggests that the structure of the supported V-P-O phase is amorphous and differs considerably from that of bulk crystalline vanadylpyrophosphate. We therefore propose that the oxidation of n-butane to maleic anhydride takes place over an amorphous surface V-P-O phase. This finding has high relevance for our understanding of the **catalytic** activity of bulk crystalline V-P-O **catalysts** as well.

CC 35-2 (Chemistry of Synthetic High Polymers)

ST oxidn **catalyst** butane maleic anhydride; **silica**
 oxidn **catalyst** support butane; **titania**
 oxidn **catalyst** support butane; vanadium oxidn
catalyst butane; phosphorus oxidn **catalyst** butane

IT Oxidation **catalysts**
 (selective; selective oxidation of butane to maleic anhydride on
 bulk and supported V-P-O **catalysts**)

IT 65506-75-4, Vanadium phosphorus oxide
 RL: CAT (Catalyst use); USES (Uses)
 (**catalysts**; selective oxidation of butane to maleic
 anhydride on bulk and supported V-P-O **catalysts**)

IT 106-97-8, n-Butane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (selective oxidation of butane to maleic anhydride on bulk and
 supported V-P-O **catalysts**)

IT 108-31-6P, Maleic anhydride, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (selective oxidation of butane to maleic anhydride on bulk and
 supported V-P-O **catalysts**)

IT 7631-86-9, **Silica**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**supports**, C 500-20; selective oxidation of butane to
 maleic anhydride on bulk and supported V-P-O **catalysts**)

IT 13463-67-7, P 25, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**supports**; selective oxidation of butane to maleic anhydride on

bulk

and supported V-P-O catalysts)

OSC.G 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13 CITINGS)

RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 26 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1998:665476 HCAPLUS Full-text

DN 129:266039

OREF 129:54135a

TI Effects of silica and titania supports
on catalytic performance of vanadium-phosphorus-oxide
catalysts

AU Ruitenbeek, M.; Van Dillen, A. J.; Koningsberger, D. C.; Geus, J. W.
CS Debye Institute, Department of Inorganic Chemistry, Utrecht
University, Utrecht, 3508 TB, Neth.

SO Studies in Surface Science and Catalysis (1998),
118(Preparation of Catalysts VII), 549-556
CODEN: SSCTDM; ISSN: 0167-2991

PB Elsevier Science B.V.

DT Journal

LA English

AB Silica - and titania-supported V-P-O catalysts (.apprx.8 weight% V)
were prepared by means of homogeneous deposition precipitation and
compared with an "organic" bulk V-P-O catalyst. All samples were
tested in the selective oxidation of n-butane to maleic anhydride
(MA), and characterized with X-ray absorption spectroscopy (EXAFS).
The catalytic performance of VPO/TiO₂ on the one hand and VPO/SiO₂
and VPO/bulk on the other hand is remarkably different. EXAFS data
anal. revealed that these differences can be explained by structural
differences between the V-P-O phases in the different catalysts.
However, VPO/SiO₂ and VPO/bulk, which display comparable yields to
MA, show a different EXAFS spectrum. This indicates that the active
phase in this reaction is not vanadylpyrophosphate.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction
Mechanisms)

Section cross-reference(s): 23, 35, 45

ST silica support vanadium phosphorus oxide
catalyst; butane oxidn vanadium phosphorus oxide
catalyst; titania support vanadium
phosphorus oxide catalyst; maleic anhydride synthesis
vanadium phosphorus oxide

IT Catalyst supports
Oxidation catalysts

(effects of silica and titania
supports on catalytic performance of

vanadium-phosphorus-oxide **catalysts**)

IT 7631-86-9, Silica, uses 13463-67-7, Titania, uses 65506-75-4, Phosphorus vanadium oxide
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (effects of **silica** and **titania**
supports on **catalytic** performance of
 vanadium-phosphorus-oxide **catalysts**)

IT 106-97-8, Butane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (effects of **silica** and **titania**
supports on **catalytic** performance of
 vanadium-phosphorus-oxide **catalysts**)

IT 108-31-6P, Maleic anhydride, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (effects of **silica** and **titania**
supports on **catalytic** performance of
 vanadium-phosphorus-oxide **catalysts**)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 27 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1998:461460 HCAPLUS Full-text

DN 129:207708

OREF 129:42087a,42090a

TI Supported **VPO catalysts** for selective oxidation
 of butane. III. Effect of preparation procedure and **SiO₂**
support

AU Bueno, J. M. C.; Bethke, G. K.; Kung, M. C.; Kung, H. H.

CS DEQ/UFSCar, Sao Carlos, 13560, Brazil

SO Catalysis Today (1998), 43(1-2), 101-110

CODEN: CATTEA; ISSN: 0920-5861

PB Elsevier Science B.V.

DT Journal

LA English

AB The effects of the nature of **silica support** and removal of soluble vanadium species by ethanol on the **catalytic** properties of silica-supported **VPO catalysts** were investigated. Ethanol preferentially removes V+5 species. For a silica-supported sample of P/V ratio much lower than two, ethanol treatment resulted in a sample of higher P/V ratio and higher selectivity for maleic anhydride in butane oxidation. The crystalline **VPO** phases formed differed on a hydrophobic vs. hydrophilic silica. (VO)₂P₂O₇ could be formed more easily on the former support. Interestingly, for all silica-supported **catalysts**, the maleic anhydride selectivity depended much more strongly on the

P/V ratio than on the method of preparation, the nature of the silica, or the crystalline VPO phase present.

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 23, 35, 45

ST maleic anhydride synthesis phosphorus vanadium oxide; butane oxidn
 VPO catalyst silica support;
 vanadyl diphosphate silica catalyst butane oxidn

IT Catalyst supports
 Oxidation catalysts
 (supported VPO catalysts for selective oxidation of butane and effect of preparation procedure and SiO2 support)

IT 7631-86-9, Silica, uses 58834-75-6, Vanadyl diphosphate 65506-75-4, Phosphorus vanadium oxide
 RL: CAT (Catalyst use); USES (Uses)
 (supported VPO catalysts for selective oxidation of butane and effect of preparation procedure and SiO2 support)

IT 64-17-5, Ethanol, properties
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
 (supported VPO catalysts for selective oxidation of butane and effect of preparation procedure and SiO2 support)

IT 106-97-8, Butane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (supported VPO catalysts for selective oxidation of butane and effect of preparation procedure and SiO2 support)

IT 108-31-6P, Maleic anhydride, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (supported VPO catalysts for selective oxidation of butane and effect of preparation procedure and SiO2 support)

OSC.G 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13 CITINGS)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 28 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1998:188289 HCAPLUS Full-text

DN 128:232566

OREF 128:46009a,46012a

TI Catalytic activity in partial oxidation of methane and physico-chemical characterization of a VPO system obtained from boiler ash

AU Alemany, Luis J.; Larrubia, Maria A.; Blasco, Jose M.
 CS Departamento de Ingenieria Quimica. Facultad de Ciencias,
 Universidad de Malaga, Malaga, E-29071, Spain
 SO Applied Catalysis, B: Environmental (1998), 16(2), 139-147
 CODEN: ACBEE3; ISSN: 0926-3373
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Bottom ash from the combustion of fossil fuels contain a higher
 amount of vanadium. The recovery and the precipitation could be an
 attractive route for the synthesis of a **catalytic** system (VPO). The
 morphol. and structure of the precursor and the final systems,
 calcined at different temps., obtained using bottom ash as raw
 material, have been assessed using different techniques. Both VPO-
 bulk system and supported on different silicas have been tested in
 the partial methane oxidation The exptl. results are comparable to
 those reported for **catalyst** systems and performed in similar
 conditions. The reactivity appears to be essentially related with
 the exposed sites and the contribution of **catalyst** surface.
 CC 51-11 (Fossil Fuels, Derivatives, and Related Products)
 Section cross-reference(s): 45, 67
 ST methane partial oxidn **catalyst** boiler ash; hydrocarbon
 oxygenate synthesis methane partial oxidn
 IT Hydrocarbons, preparation
 RL: PNU (Preparation, unclassified); PREP (Preparation)
 (C>1; boiler ash-derived **catalysts** for partial oxidation
 of methane)
 IT Hydrocarbons, preparation
 RL: PNU (Preparation, unclassified); PREP (Preparation)
 (C2; boiler ash-derived **catalysts** for partial oxidation of
 methane)
 IT IR spectra
 Raman spectra
 X-ray diffraction
 (boiler ash-derived VPO **catalysts** for partial
 oxidation of methane)
 IT Oxidation **catalysts**
 (boiler ash-derived **catalysts** for partial oxidation of
 methane)
 IT Ashes (residues)
 (fuel-oil; boiler ash-derived **catalysts** for partial
 oxidation of methane)
 IT 7440-62-2, Vanadium, uses 7723-14-0, Phosphorus, uses
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (boiler ash-derived VPO **catalysts** for partial
 oxidation of methane)
 IT 74-82-8, Methane, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (boiler ash-derived **catalysts** for partial oxidation of)
 IT 124-38-9, Carbon dioxide, formation (nonpreparative)
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
 (boiler ash-derived **catalysts** for partial oxidation of
 methane)
 IT 50-00-0P, Formaldehyde, preparation 67-56-1P, Methanol,
 preparation 630-08-0P, Carbon monoxide, preparation
 RL: PNU (Preparation, unclassified); PREP (Preparation)
 (boiler ash-derived **catalysts** for partial oxidation of
 methane)
 IT 7631-86-9, **Silica**, uses
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (**catalyst supports**; boiler ash-derived
VPO catalysts for partial oxidation of methane)
 OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1
 CITINGS)
 RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

 L41 ANSWER 29 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1991:688167 HCAPLUS Full-text
 DN 115:288167
 OREF 115:48787a,48790a
 TI Nature of the structures formed upon fixation of vanadium and
 phosphorus on silica surface
 AU Zazhigalov, V. A.; Belousov, V. M.; Bacherikova, I. V.; Zaitsev, Yu.
 P.
 CS Inst. Fiz. Khim. im. Pisarzhevskogo, Kiev, USSR
 SO Teoreticheskaya i Eksperimental'naya Khimiya (1991),
 27(3), 370-5
 CODEN: TEKHA4; ISSN: 0497-2627
 DT Journal
 LA Russian
 AB The V-P/SiO₂ **catalysts** obtained by impregnation and grafting with
 different amount of V and P were studied by ESR, SEM, and EXAFS.
 Irresp. of the synthesis method, V concentration, or P/V ratio,
 regions of the crystalline phase β -VPO₄ with low concns. of V⁴⁺ ions
 exist on the support surface.
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction
 Mechanisms)
 ST vanadium phosphorus silica **catalyst** prepn; surface compn
 structure vanadium phosphorus **catalyst**
 IT **Catalysts** and **Catalysis**
 (vanadium-phosphorus-silica, prepared by grafting or impregnation,
 surface composition and structure on)
 IT 7440-62-2, Vanadium, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)
 (catalyst, with phosphorus on silica
 support, surface composition and structure of)
 IT 7723-14-0, Phosphorus, uses and miscellaneous
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst, with vanadium on silica
 support, surface composition and structure of)
 IT 12359-27-2, Vanadium oxide phosphate (VOP04)
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalysts with surface phases of, on silica
 supports)
 OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2
 CITINGS)

L41 ANSWER 30 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1991:586370 HCAPLUS Full-text

DN 115:186370

OREF 115:31805a,31808a

TI Selective oxidation of carbon monoxide in a mixture

IN Bonifaz, Christobal; Corbin, David R.

PA du Pont de Nemours, E. I., and Co., USA

SO U.S., 6 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	US 5045297	A	19910903	US 1989-341859	198903 31

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PRAI US 1989-341859 19890331 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The process comprises contacting the CO and the hydrocarbon and/or
 partially oxidized hydrocarbon mixture containing C₄H₁₀ and maleic
 anhydride with a catalyst comprising Pd or Pt metal loaded on a
 support selected from SiO₂ or a SiO₂ containing V phosphate at 350-
 450° in the presence of O.

IC ICM C01B031-20

INCL 423437000

CC 49-10 (Industrial Inorganic Chemicals)

ST carbon monoxide oxidn platinum catalyst; palladium

catalyst carbon monoxide oxidn; silica

catalyst support carbon monoxide oxidn;

vanadium phosphate silica

catalyst support; butane mixt carbon monoxide
selective oxidn; maleic anhydride mixt carbon monoxide oxidn

IT 1343-98-2, Silicic acid
RL: CAT (Catalyst use); USES (Uses)
(**catalyst support**, for selective oxidation of carbon monoxide in hydrocarbon mixture)

IT 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst**, on **silica support**, for selective oxidation of carbon monoxide in hydrocarbon mixture)

IT 106-97-8, Butane, reactions 108-31-6, Maleic anhydride, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrocarbon mixture containing, selective oxidation of carbon monoxide in, platinum and palladium **catalysts** on **silica support** for)

IT 1314-62-1, Vanadium pentoxide, uses and miscellaneous 7664-38-2, Phosphoric acid, uses and miscellaneous
RL: USES (Uses)
(polysilicic acid treated with, for **catalyst support**, for selective oxidation of carbon monoxide in hydrocarbon mixture)

IT 630-08-0, Carbon monoxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(selective oxidation of, in hydrocarbon mixture, palladium and platinum **catalyst** on **silica support** for)

OSC.G 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L41 ANSWER 31 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1984:491475 HCAPLUS Full-text

DN 101:91475

OREF 101:14044a

TI Oxidation of 1,3-pentadiene to maleic anhydride

AU Belostotskaya, I. L.; Glukhovskii, N. G.; Saratova, S. D.; Klionskaya, E. A.

CS Vses. Nauchno-Issled. Inst. Neftekhim. Protsessov, Leningrad, USSR
SO Neftekhimiya (1984), 24(3), 399-403
CODEN: NEFTAH; ISSN: 0028-2421

DT Journal

LA Russian

AB Maleic anhydride (I) [108-31-6] was prepared by oxidation of 1,3-pentadiene [504-60-9] (a mixture of cis and trans isomers, 95% purity) in the presence of a V-P **catalyst** on silica gel (and in 1

case without the silica gel support), and the yield and selectivity of the reaction were determined as function of sp. surface and active substance content of the catalyst. The yield of I reached 72 mol% in the presence of catalyst containing .apprx.26% active substance and having sp. surface .apprx.20 m²/g. The catalysts were prepared by impregnation of silica gel with vanadium phosphate, and drying and calcining the product in air at 480°. The V2O5-P2O5 mol ratio of the catalyst was 1:1.2, and the active substance content and sp. surface ranges were 12.9-100.0% and 3.9-38.0 m²/g, resp.

CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 23

ST pentadiene oxidn maleic anhydride; piperylene oxidn maleic anhydride; vanadium phosphorus oxidn catalyst

IT Oxidation
 (of piperylene to maleic anhydride)

IT Oxidation catalysts
 (vanadium-phosphorus on silica gel, for piperylene to maleic anhydride)

IT 14542-94-0
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for oxidation of piperylene to maleic anhydride)

IT 504-60-9
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidation of, to maleic anhydride, vanadium-phosphorus oxide catalysts for)

IT 108-31-6P, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, by oxidation of piperylene, vanadium-phosphorus oxide catalysts for)

L41 ANSWER 32 OF 32 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1964:67861 HCAPLUS Full-text

DN 60:67861

OREF 60:11902g-h,11903a

TI Maleic anhydride by vapor-phase oxidation of butene

IN Skinner, Wilfred A.; Tieszen, Dale O.

PA Petro-Tex Chemical Corp.

SO 12 pp.

DT Patent

LA Unavailable

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	

PI	FR 1345558		19631213	FR 1961-873499	

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GB 993415

GB

PRAI US

19600919 <--

AB A **catalyst** containing Mo, V, and P, on a **silica gel support** prepared by hydrolysis of (EtO)₄Si (I) was effective in the title process. Thus, 121 ml. I was heated 1 hr. on a steam bath with 61 ml. EtOH and 43 ml. H₂O, the silica gel thus formed washed with H₂O and added to a solution of 41 g. (NH₄)₆Mo₇O₂₄·4H₂O, 9 g. NH₄VO₃, and 1.7 ml. 85% H₃PO₄ in 250 ml. H₂O, the whole heated to dryness, pressed into .apprx.3 mm. + 3 mm. tablets, and activated 18 hrs. at 400-70° in a current of 400 ml. air/min. A mixture of 20 ml. 2-butene plus 2000 ml. air/min. was passed over the **catalyst** at 310-15°, contact time 1.5 sec. The exit gas contained 55% maleic acid, and 78% total acids yields (based on butene).

IC C07C

CC 33 (Aliphatic Compounds)

IT Pumice

(catalysts from Mo, V oxide and, in oxidation of benzene)

IT Anhydrides

(dicarboxylic)

IT Catalysts and Catalysis

(in oxidation, of 2-butene, Mo V phosphate silicate as)

IT Catalysts and Catalysis

(in oxidation, of benzene, Mo V oxide on pumice as)

IT Oxidation

(of 1-butene (liquid) in presence of 2-butene maleic anhydride by)

IT Oxidation

(of benzene, maleic anhydride by)

IT Molybdenum vanadium oxide, V₆Mo₄O₂₅

(catalyst from pumice and, in oxidation of benzene)

IT Molybdenum vanadium phosphate silicate

(catalyst in oxidation of 2-butene)

IT Vanadium molybdenum phosphate silicate

(catalyst, in oxidation of 2-butene)

IT Vanadium molybdenum oxide

(catalysts from pumice and, in oxidation of benzene)

IT 108-31-6P, Maleic anhydride

RL: PREP (Preparation)

(manufacture of, from 2-butene)

IT 108-31-6P, Maleic anhydride

RL: PREP (Preparation)

(manufacture of, from benzene)

IT 71-43-2, Benzene 107-01-7, 2-Butene

(oxidation of, to maleic anhydride)

=> d 144 1-20 bib abs hitind

L44 ANSWER 1 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2006:800232 HCAPLUS Full-text
 DN 145:213024
 TI An improved process for the preparation of cyanopyridines
 IN Farsinavis, Suresh; Rao, Panja Kanta; Rao, Alla Venkat Rama;
 Kulkarni, Shivanand Janardan; Rao, Revur Ramachandra; Subrahmanyam,
 Machiraju
 PA Council of Scientific and Industrial Research, India
 SO Indian, 9 pp.
 CODEN: INXXAP

DT Patent
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	IN 190431	A1	20030726	IN 1995-DE955	19950525

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PRAI IN 1995-DE955 19950525 <--
 OS CASREACT 145:213024
 AB Title process comprises the steps of: passing a feed consisting of 3-picoline or 4-picoline and ammonia in a molar ratio ranging from 1:1 to 1:20, water and air/oxygen ranging from 30 cc per min. to 100 cc per min. over a vanadium -silico-alumino-phosphate (VSAPO) catalyst prepared by the process such as herein described at a temperature in the range of 300-450°C and weight hourly space velocity of liquid feed products in the range of 0.25 to 1.0 per h, recovering the cyanopyridines by conventional methods.
 IC ICM C07C121-00
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67
 ST cyanopyridine picoline ammonia vanadium silico alumino phosphate VSAPO
 IT Ammoxidation
 Ammoxidation catalysts
 (preparation of cyanopyridines from picolines using vanadium -silico-alumino-phosphate ammoxidn. catalysts
)
 IT Silicoaluminophosphate zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (vanadium-containing, VSAPO; preparation of cyanopyridines from

picolines

using vanadium-silico-alumino-phosphate
ammoxidn. catalysts)

IT 100-48-1P, 4-Pyridinecarbonitrile 100-54-9P, 3-Cyanopyridine
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of cyanopyridines from picolines using vanadium
-silico-alumino-phosphate ammoxidn. catalysts
)

IT 108-89-4, 4-Picoline 108-99-6, 3-
Picoline 7664-41-7, Ammonia, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of cyanopyridines from picolines using vanadium
-silico-alumino-phosphate ammoxidn. catalysts
)

IT 1941-30-6
RL: CAT (Catalyst use); USES (Uses)
(template; preparation of cyanopyridines from picolines using
vanadium-silico-alumino-phosphate ammoxidn.
catalysts)

L44 ANSWER 2 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2005:159890 HCAPLUS Full-text

DN 142:219137

TI Catalysts for the production of cyanopyridines by Instant
vapor-phase ammoxidation Application

IN Fischer, Achim; Martin, Andreas; Luecke, Bernhard; Kalevaru, Venkata
Narayana; Weckbecker, Christoph; Huthmacher, Klaus

PA Reilly Industries, Inc., USA

SO Ger. Offen., 8 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	DE 10335454	A1	20050224	DE 2003-10335454	200308 02
				<--	
	WO 2005016505	A2	20050224	WO 2004-US24939	200407 30
				<--	
	WO 2005016505	A3	20050609		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,				
	CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,				

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
 MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,
 SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
 VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,
 DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL,
 PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
 GW, ML, MR, NE, SN, TD, TG

EP 1654233 A2 20060510 EP 2004-779870

200407
 30

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK
 CN 1832923 A 20060913 CN 2004-80022489

200407
 30

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CN 100545149 C 20090930
 JP 2007501119 T 20070125 JP 2006-522661

200407
 30

<--

IN 2006CN00419 A 20070518 IN 2006-CN419

200602
 01

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US 20070117984 A1 20070524 US 2007-566868

200701
 16

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PRAI DE 2003-10335454 A 20030802 <--
 WO 2004-US24939 W 20040730 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The title **catalysts**, which give good space-time yields and selectivity at $\leq 440^\circ$, have the formula $[V_1PaXbYcOd]e[Z]f$ (X = Cr, Mo, Fe, Ru, Co, Rh, Ir, Ni, Pd, Pt, Zn, Nb; Y = cyclic N compound; Z = SiO₂, Al₂O₃, ZrO₂, TiO₂; a = 0.1-2.5; b = 0-3.0; c = 0.1-10; e = 5-100; f = 95-0). Stirring 0.1 mol V₂O₅ in 110 mL BuOH and 73 mL PhCH₂OH at reflux for 3 h and then overnight at room temperature, adding a stoichiometric amount of 85% H₃PO₄, refluxing for 2 h, filtering at room temperature, washing with EtOH, drying at 120°, and calcining at 450° in N₂O for 3 h gave (VO)₂P₂O₇ (I). Passing 3-methylpyridine with a 28.4:5.6:8.2 mixture of air, NH₃, and H₂O at space velocity 2300/h over a 5 g 1:1 I-corundum at 360° gave

conversion 52, yield 43.7, and selectivity 84 mol%, resp. (CO and CO₂ 0.7 and 4.9 mol%).

IC ICM B01J027-198

CC 27-2 (Heterocyclic Compounds (One Hetero Atom))

Section cross-reference(s): 67

ST ammoxidn methylpyridine **catalyst**; **vanadium phosphate catalyst** ammoxidn; pyridinecarbonitrile manuf ammoxidn **catalyst**

IT Ammoxidation **catalysts**

(**catalysts** for the production of cyanopyridines by vapor-phase ammoxidn.)

IT 108-99-6DP, 3-Picoline, reaction

products with vanadyl phosphate 7439-88-5P, Iridium, preparation 7439-89-6P, Iron, preparation 7439-98-7P, Molybdenum, preparation 7440-02-0P, Nickel, preparation 7440-03-1P, Niobium, preparation 7440-05-3P, Palladium, preparation 7440-06-4P, Platinum, preparation 7440-16-6P, Rhodium, preparation 7440-18-8P, Ruthenium, preparation 7440-33-7P, Tungsten, preparation 7440-47-3P, Chromium, preparation 7440-48-4P, Cobalt, preparation 7440-66-6P, Zinc, preparation 58834-75-6P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(**catalysts** for the production of cyanopyridines by vapor-phase ammoxidn.)

IT 100-54-9P, 3-Cyanopyridine

RL: IMF (Industrial manufacture); PREP (Preparation)
(**catalysts** for the production of cyanopyridines by vapor-phase ammoxidn.)

IT 108-99-6, 3-Picoline

RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalysts** for vapor-phase ammoxidn. of methylpyridines)

L44 ANSWER 3 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2004:857479 HCAPLUS Full-text

DN 141:320777

TI Ti-pillared clay based vanadia **catalyst** and process for preparation

IN Roy, Shyam Kishore; Roy, Subhash Chandra; Dutta, Pasupati; Nandi, Laxmi Narayan; Yadav, Satya Niketan

PA Council of Scientific and Industrial Research, India; Council Scient Ind Res

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
PI WO 2004087310	A1	20041014	WO 2003-IN101	200303 31
<--				
WO 2004087310	A9	20051110		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003226632	A1	20041025	AU 2003-226632	200303 31
<--				
AU 2003226632	B2	20070322		
EP 1617946	A1	20060125	EP 2003-816516	200303 31
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2006513852	T	20060427	JP 2004-570070	200303 31
<--				
CN 1771084	A	20060510	CN 2003-826467	200303 31
<--				
CN 100518926	C	20090729		
BR 2003018258	A	20060523	BR 2003-18258	200303 31
<--				
PRAI WO 2003-IN101	A	20030331	<--	
AB This invention relates to a process for the preparation of highly active and selective ammoxidn. catalyst using a complex metal oxide				

containing P, V and Mo supported on Ti-PILC which process involves heating on water bath a V source with oxalic acid in the presence of H₂O to form vanadyl oxalate; adding a source of phosphorous and a source of Mo and Ti-PILC and heating the resultant mixture in the presence of air at a temperature at 110-450° for a period at 15-35 h. This involves also relates to the use of said ammoxidn. **catalyst** in the preparation of heteroarom. nitriles from methylpyridines which comprises passing as a reactant stream a gaseous mixture comprising, a Me substituted pyridine, NH₃ and O (air) over the fixed bed ammoxidn. **catalyst** at a temperature of .apprx.350-450°.

- IC ICM B01J021-06
ICS B01J021-16; B01J029-04; B01J027-18; C07D213-00
- CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 27
- ST molybdo vanadophosphate titania pillared montmorillonite supported
prepn ammoxidn **catalyst**; methylpyridine ammoxidn
molybdo vanadophosphate supported **catalyst**
- IT Nitriles, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation by ammoxidn. of methylpyridines in presence of
molybdo vanadophosphate supported on titania-pillared
montmorillonite as **catalyst**)
- IT Ammoxidation **catalysts**
(preparation of molybdo vanadophosphate supported on titania-
pillared
montmorillonite for methylpyridines)
- IT 108-99-6, 3-Methylpyridine
RL: RCT (Reactant); RACT (Reactant or reagent)
(ammoxidn. in presence of molybdo vanadophosphate supported on
titania-pillared montmorillonite as **catalysts**)
- IT 15500-04-6P, Vanadyl oxalate
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(preparation and reactant for preparation of
molybdo vanadophosphate
supported on titania-pillared montmorillonite as ammoxidn.
catalysts for methylpyridines)
- IT 1318-93-0DP, Montmorillonite, titania-pillared montmorillonite,
molybdo vanadophosphate supported 13463-67-7DP, Titania,
titania-pillared montmorillonite, molybdo vanadophosphate supported
37280-68-5DP, Molybdenum **vanadium** hydroxide oxide
phosphate, titania-pillared montmorillonite supported
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(preparation as ammoxidn. **catalysts** for methylpyridines)
- IT 7439-91-0D, Lanthanum, titania-pillared montmorillonite containing,

molybdoxovanadophosphate supported 7440-45-1D, Cerium,
titania-pillared montmorillonite containing, molybdoxovanadophosphate
supported

RL: NUU (Other use, unclassified); USES (Uses)
(preparation as ammoxidn. **catalysts** for methylpyridines)

IT 100-54-9P, 3-Cyanopyridine

RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation by ammoxidn. of methylpyridine in presence of
molybdoxovanadophosphate supported on titania-pillared
montmorillonite as **catalysts**)

IT 144-62-7, Oxalic acid, reactions 1313-27-5, Molybdenum trioxide,
reactions 1314-62-1, Vanadium pentoxide, reactions 2466-09-3,
Diphosphoric acid 7664-38-2, Phosphoric acid, reactions
7803-55-6, Ammonium metavanadate 10343-62-1, Metaphosphoric acid
11098-84-3, Ammonium molybdate 11099-11-9, Vanadium oxide
27774-13-6, Vanadyl sulfate

RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of molybdoxovanadophosphate supported on
titania-pillared montmorillonite as ammoxidn. **catalysts**
for methylpyridines)

IT 12026-53-8, Paragonite

RL: NUU (Other use, unclassified); USES (Uses)
(use in preparation of molybdoxovanadophosphate supported on
titania-pillared paragonite as ammoxidn. **catalysts** for
methylpyridines)

IT 12174-40-2, Rectorite

RL: NUU (Other use, unclassified); USES (Uses)
(use in preparation of molybdoxovanadophosphate supported on
titania-pillared rectorite as ammoxidn. **catalysts** for
methylpyridines)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 4 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2004:504910 HCAPLUS Full-text

DN 141:173658

TI Crystalline CrV0.95P0.05O4 **catalyst** for the vapor-phase
oxidation of picolines

AU Takehira, K.; Shishido, T.; Song, Z.; Matsushita, T.; Kawabata, T.;
Takaki, K.

CS Department of Chemistry and Chemical Engineering, Graduate School of
Engineering, Hiroshima University, 1-4-1 Kagamiyama,
Higashi-Hiroshima, 739-8527, Japan

SO Catalysis Today (2004), 91-92, 7-11

CODEN: CATTEA; ISSN: 0920-5861

PB Elsevier Science B.V.

DT Journal

LA English

OS CASREACT 141:173658

AB The **catalytic** behavior of CrV0.95P0.05O4 was studied in the selective oxidation of picolines and the oxidation mechanism is discussed. Broensted acid site was detected on the surface of CrV0.95P0.05O4, and the amount increased by the addition of steam in the reaction mixture, resulting in an enhanced activity for the selective oxidation. Picoline is adsorbed via the N atom coordination to Broensted acid site, and the substituted Me group is oxidized by surface oxide ion to produce aldehyde and then acid. Thus, Mars and van Krevelen mechanism is suggested for picoline oxidation based on the DRIFTS anal. 2- and 4-Picolines were more quickly oxidized than **3-picoline** due to the inductive hyperconjugative effect of nitrogen, resulting in an easy leaving of proton from the Me group. 4-Picoline produced almost quant. isonicotinic acid, while 2-picoline afforded picoline-2-carbaldehyde as the main product due to the instability of the acid product, i.e., the decarboxylation of picolinic acid took place to form pyridine.

CC 21-2 (General Organic Chemistry)
Section cross-reference(s): 27, 67

ST chromium vanadium phosphorus oxide **catalyst** vapor phase oxidn picoline; cryst oxide **catalyst** vapor phase oxidn picoline

IT Adsorbed substances
Methyl group
Steam
Surface reaction
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT Bronsted acids
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT IR reflectance spectra
(diffuse, Fourier-transform; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT Oxidation
Oxidation **catalysts**
(gas-phase; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT Hyperconjugation
Inductive effect
(oxidation rapidity and; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT Decarboxylation

- (picolinic acid; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT Oxidation
(selective; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT Reaction mechanism
(surface, Mars and van Krevelen; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 586-95-8P, 4-Pyridinemethanol 17252-51-6P, 4,4'-Trimethylenedipyridine
RL: BYP (Byproduct); PREP (Preparation)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 110-86-1P, Pyridine, preparation
RL: BYP (Byproduct); SPN (Synthetic preparation); PREP (Preparation)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 474900-66-8, Chromium **vanadium** oxide **phosphate**
(CrV0.95O3.8(PO4)0.05)
RL: CAT (Catalyst use); USES (Uses)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 108-89-4, 4-Picoline 108-89-4D, 4-Picoline, **catalyst**
surface bound 109-06-8, 2-Picoline 109-06-8D, 2-Picoline, **catalyst** surface bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 98-98-6P, Picolinic acid
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 55-22-1P, Isonicotinic acid, preparation 1121-60-4P, Pyridine-2-carbaldehyde
RL: SPN (Synthetic preparation); PREP (Preparation)
(crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)
- IT 872-85-5P, Pyridine-4-carbaldehyde
RL: SPN (Synthetic preparation); PREP (Preparation)
(mechanistic reaction intermediate in carboxylic acid formation;

crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

IT 108-99-6, 3-Picoline
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (slow reaction; crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 5 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:800623 HCAPLUS Full-text
 DN 140:321210
 TI Study on ammoxidation of heteroaromatic compounds to prepare aromatic nitriles. I. Ammoxidation of 3-picoline to nicotinonitrile
 AU Yu, Peng; Huang, Chi; Li, Xiao-Yun; Zheng, Qiong
 CS College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China
 SO Wuhan Daxue Xuebao, Lixueban (2003), 49(2), 179-182
 CODEN: WDXLA5
 PB Wuhan Daxue Qikanshe
 DT Journal
 LA Chinese
 OS CASREACT 140:321210
 AB Ammoxidn. of 3-picoline to nicotinonitrile on VPO/SiO2 (vanadium-phosphorus oxide/silica) **catalysts** has been investigated. Based on appraising tests, the efficient **catalysts** have been found. The influence of the components of the **catalyst**, reaction temperature, the ratio of air, the ratio of ammonia and ratio of water on the conversion of 3-picoline, the molar yield and selectivity of nicotinonitrile have been researched resp. Using **catalyst** Z697, on optimum conditions the highest conversion is 100%, molar yield is 85.2%. The nicotinonitrile obtained is white needle crystal with the purity higher than 99%.

CC 27-16 (Heterocyclic Compounds (One Hetero Atom))
 Section cross-reference(s): 45, 67

ST picoline ammoxidn **catalyst** vanadium phosphorus oxide silica; nicotinonitrile prepn

IT Ammoxidation
 Ammoxidation **catalysts**
 (ammoxidn. of 3-picoline to nicotinonitrile with vanadium-phosphorus oxide/silica **catalyst**)

IT 7631-86-9, Silica, uses 65506-75-4, Phosphorus vanadium oxide
 RL: CAT (Catalyst use); USES (Uses)
 (ammoxidn. of 3-picoline to nicotinonitrile

with vanadium-phosphorus oxide/silica catalyst)

IT 108-99-6, 3-Picoline
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (ammoxidn. of 3-picoline to nicotinonitrile
 with vanadium-phosphorus oxide/silica catalyst)

IT 100-54-9P, Nicotinonitrile
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (ammoxidn. of 3-picoline to nicotinonitrile
 with vanadium-phosphorus oxide/silica catalyst)

L44 ANSWER 6 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2003:482931 HCAPLUS Full-text
 DN 139:239015
 TI Crystalline CrV1-xPxO4 catalysts for the vapor-phase
 oxidation of 3-picoline
 AU Song, Zhaoxia; Matsushita, Toshiyuki; Shishido, Tetsuya; Takehira,
 Katsuomi
 CS Graduate School of Engineering, Department of Chemistry and Chemical
 Engineering, Hiroshima University, 1-4-1 Kagamiyama,
 Higashi-Hiroshima, 739-8527, Japan
 SO Journal of Catalysis (2003), 218(1), 32-41
 CODEN: JCTLA5; ISSN: 0021-9517
 PB Elsevier Science
 DT Journal
 LA English
 AB The heterogeneously catalyzed vapor-phase oxidation of 3-picoline to
 nicotinic acid over mixed oxides, CrV1-xPxO4, were studied at 300-
 400°. Characterizations of the catalysts were carried out using x-ray
 diffraction, FTIR, TG-DTA, BET, NH3-TPD, TPR, and pyridine adsorption
 diffuse reflectance IR Fourier-transform spectra (DRIFTS).
 Characterizations of the catalysts were carried out using x-ray
 diffraction, FTIR, TG-DTA, BET, NH3-TPD, TPR, and pyridine adsorption
 diffuse reflectance IR Fourier-transform spectra (DRIFTS). The mixed
 oxides, CrV1-xPxO4 (x = 0-1.0), were precipitated by adjusting the pH
 from an aqueous solution of the mixture of the raw materials. The
 ppts. were calcined at 550-700° and employed as the catalyst for the
 selective oxidation of 3- picoline. During the calcination, a
 crystallization of monoclinic CrVO4-I phase of α -MnMoO4 structure was
 clearly observed by TG-DTA, FTIR, and XRD analyses of the CrV1-xPxO4,
 in the range of x < 0.1. In these CrV1-xPxO4, P atoms replace V
 atoms in the VO4 tetrahedra still keeping a monoclinic CrVO4-I
 structure. This structure changed to amorphous by further addition
 of P (x > 0.25) or to orthorhombic CrVO4-III by further calcination
 at high temperature (>700°), resulting in the catalyst deactivation.
 CrVO4-I was originally active and the addition of a small amount of P
 resulted in a high enhancement in the catalytic activity;
 CrV0.95P0.05O4 showed the highest activity among the catalysts

tested. NH₃-TPD showed an increase in the acid site by replacing V with a small amount of P in CrVO₄-I. A favorable effect of H₂O addition suggests that Bronsted acid assists the selective oxidation, and this was confirmed by IR study of pyridine adsorption on the catalysts. The active catalysts, CrV_{1-x}P_xO₄ (0 < x < 0.1), alone revealed a weak reduction peak of V around 350° in the TPR, and the peak temperature was the lowest over the most active catalyst. The reduction-oxidation property was reversibly observed with the peak when the catalyst was treated by H₂ and O₂ atmosphere alternately. Also, activation energy calculated from 3-picoline consumption was also the lowest over the most active catalyst. All the V species are isolated as VO₄ tetrahedra in the CrVO₄-I structure and considered to work as the active sites via its reduction-oxidation assisted by both Cr and phosphorous atoms. 3-Picoline is selectively oxidized on the V sites by the reduction-oxidation further assisted by the Bronsted-acid sites over the crystallized CrV_{0.95}P_{0.05}O₄ catalyst.

- CC 78-5 (Inorganic Chemicals and Reactions)
 Section cross-reference(s): 27, 67, 75
- ST chromium vanadium phosphate prepn oxidn
 catalyst picoline; crystal structure chromium vanadate
- IT Acidity
 (of chromium vanadium phosphates as selective
 oxidation catalysts for picoline)
- IT Activation energy
 (of oxidation of picoline in presence of chromium vanadium
 phosphates as catalysts)
- IT Oxidation catalysts
 (preparation of chromium vanadium phosphates as
 selective oxidation catalyst for picoline)
- IT 13548-45-3P, Chromium vanadium oxide (CrVO₄)
 RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (preparation and surface area and crystal structure and selective
 oxidation catalyst for picoline)
- IT 7789-04-0P, Chromium phosphate (CrPO₄) 474900-65-7P, Chromium
 vanadium oxide phosphate (CrV_{0.98}O_{3.92}(PO₄)_{0.02})
 474900-66-8P, Chromium vanadium oxide phosphate
 (CrV_{0.95}O_{3.8}(PO₄)_{0.05}) 474900-67-9P, Chromium vanadium
 oxide phosphate (CrV_{0.90}O_{3.6}(PO₄)_{0.1}) 474900-68-0P,
 Chromium vanadium oxide phosphate
 (CrV_{0.75}O₃(PO₄)_{0.25}) 474900-69-1P, Chromium vanadium
 oxide phosphate (CrV_{0.50}O₂(PO₄)_{0.5})
 RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (preparation and surface area and selective oxidation catalyst
 for picoline)
- IT 108-99-6, 3-Picoline

RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of chromium **vanadium phosphates** as
 selective oxidation **catalyst** for picoline)

IT 7722-76-1, Ammonium dihydrogen phosphate 7803-55-6, Ammonium
 metavanadate 13548-38-4, Chromium trinitrate

RL: RCT (Reactant); RACT (Reactant or reagent)
 (reactant for preparation of chromium **vanadium
 phosphates** as selective oxidation **catalyst** for
 picoline)

OSC.G 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7
 CITINGS)

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 7 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2003:447466 HCAPLUS Full-text

DN 139:230215

TI In situ DRIFTS study of picoline oxidation over CrV0.95P0.0504
catalyst

AU Shishido, T.; Song, Z.; Matsushita, T.; Takaki, K.; Takehira, K.

CS Department of Chemistry and Chemical Engineering, Graduate School of
 Engineering, Hiroshima University, Higashi-Hiroshima, 739-8527,
 Japan

SO Physical Chemistry Chemical Physics (2003), 5(12),
 2710-2718
 CODEN: PPCPFQ; ISSN: 1463-9076

PB Royal Society of Chemistry

DT Journal

LA English

AB The **catalytic** behavior of CrV0.95P0.0504 has been investigated in the
 selective oxidns. of 2-, 3- and 4-picolines by in situ DRIFTS, and
 the model of picoline adsorption and the oxidation mechanism are
 proposed. Both Lewis and Bronsted acid sites were detected on the
 surface of CrV0.95P0.0504, and the number of the latter increased on
 the addition of steam in the reaction mixture, resulting in enhanced
 activity for selective oxidns. The enhanced activity due to water
 addition is interpreted by the fact that Bronsted acid sites are
 produced by the hydrolysis of V-O-Cr and activate picoline mols. by
 withdrawing the electrons of the pyridine ring, and at the same time,
 enable to accelerate the desorption of the acid products from the
catalyst surface. Every 2-, 3- and 4-picoline was adsorbed on the
catalyst surface via the N atom donating the electrons to the
 Bronsted acid sites, and the substituted Me group was oxidized via
 hydrogen abstraction by surface oxide ion to form the radical
 intermediate, followed by oxygen insertion to produce the
 corresponding aldehyde and then acid. Even in the absence of gaseous
 oxygen, the oxygenated products were formed and observed over the

catalyst surface by in situ DRIFTS. Thus, a Mars and van Krevelen mechanism was suggested for 2-, 3- and 4-picolines oxidns. based on the spectral anal. Both 2- and 4-picolines were more quickly oxidized than 3- **picoline** due to the inductive hyperconjugative effect of nitrogen, resulting in an easy leaving of proton from the Me group. 4-Picoline produced almost quant. isonocotinic acid, while 2-picoline afforded 2-picoline aldehyde as the main product due to the instability of the acid product, i.e., the decarboxylation of picolinic acid took place to form pyridine.

CC 22-4 (Physical Organic Chemistry)

Section cross-reference(s): 67

ST DRIFTS study picoline oxidn chromium vanadium phosphorus oxide **catalyst**

IT Surface acidity

(Bronsted; in situ DRIFTS study of picoline oxidation over chromium

vanadium phosphorus oxide **catalyst**)

IT Diffuse reflectance IR spectroscopy

(Fourier-transform; in situ DRIFTS study of picoline oxidation over

chromium vanadium phosphorus oxide **catalyst**)

IT Surface acidity

(Lewis; In situ DRIFTS study of picoline oxidation over CrV0.95P0.05O4 **catalyst**)

IT Activation energy

(apparent; in situ DRIFTS study of picoline oxidation over chromium

vanadium phosphorus oxide **catalyst**)

IT Hyperconjugation

Oxidation

Oxidation **catalysts**

(in situ DRIFTS study of picoline oxidation over chromium vanadium phosphorus oxide **catalyst**)

IT Lewis acidity

(surface; In situ DRIFTS study of picoline oxidation over CrV0.95P0.05O4 **catalyst**)

IT Bronsted acidity

(surface; in situ DRIFTS study of picoline oxidation over chromium vanadium phosphorus oxide **catalyst**)

IT 474900-66-8, Chromium vanadium oxide phosphate

(CrV0.95O3.8(PO4)0.05)

RL: CAT (Catalyst use); USES (Uses)

(in situ DRIFTS study of picoline oxidation over chromium vanadium phosphorus oxide **catalyst**)

IT 108-89-4, 4-Picoline 108-99-6, 3-

Picoline 109-06-8, 2-Picoline

RL: RCT (Reactant); RACT (Reactant or reagent)

(in situ DRIFTS study of picoline oxidation over chromium vanadium phosphorus oxide **catalyst**)

OSC.G 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

RE.CNT 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 8 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2002:873614 HCAPLUS Full-text

DN 137:369977

TI Gas-phase oxidation **catalysts**, and preparation of aldehydes or carboxylic acids using them

IN Kuroda, Yasushi; Tsuji, Katsuyuki; Nakajo, Tetsuo; Takehira, Katsuomi; Shishido, Tetsuya

PA Showa Denko K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT ~~Patent~~

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2002331239	A	20021119	JP 2002-56067	20020301

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PRAI JP 2001-62011 A 20010306 <--

AB Title compds. are prepared by gas-phase oxidation of alkyl compds. in the presence of **catalysts** containing V- and Cr-containing crystalline mixed oxides showing specific x-ray diffraction pattern (given in claim). Activity of the **catalysts** is evaluated by powder x-ray diffraction. β -Picoline was oxidized by O in the presence of CrVO₄ (mainly comprising CrVO₄-I) at 360° to give 43.5% nicotinic acid.

IC ICM B01J023-26

ICS B01J027-199; C01B025-45; C01G037-00; C07D213-807; C07B061-00

CC 27-16 (Heterocyclic Compounds (One Hetero Atom))

Section cross-reference(s): 67

ST oxidn **catalyst** vanadium chromium oxide; aldehyde prepn
oxidn **catalyst** mixed oxide; carboxylic acid prepn oxidn
catalyst oxide; picoline oxidn chromium vanadium oxide
catalyst; nicotinic acid prepn gas phase oxidn

IT Powder x-ray diffractometry

(**catalyst** evaluation by; oxide **catalysts** for
gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

IT Oxidation **catalysts**

(gas-phase; oxide **catalysts** for gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

IT Aldehydes, preparation
Carboxylic acids, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(oxide **catalysts** for gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

IT 13548-45-3P, Chromium vanadium oxide (CrV04) 369647-56-3P, Aluminum chromium vanadium oxide (Al0.5Cr0.5V04) 474900-66-8P, Chromium **vanadium** oxide **phosphate** (CrV0.95O3.8(P04)0.05)
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(oxide **catalysts** for gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

IT 55-22-1P, Isonicotinic acid, preparation 59-67-6P, Nicotinic acid, preparation 98-98-6P, 2-Pyridinecarboxylic acid 872-85-5P, 4-Pyridinecarbaldehyde 1121-60-4P, 2-Pyridinecarboxaldehyde
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(oxide **catalysts** for gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

IT 108-89-4, γ -Picoline 108-99-6, β -Picoline 109-06-8, α -Picoline
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxide **catalysts** for gas-phase oxidation of alkyl compds. into aldehydes or carboxylic acids)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L44 ANSWER 9 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2002:415352 HCAPLUS Full-text
DN 137:352468
TI Crystalline CrV0.95P0.05O4 **catalyst** for vapor-phase oxidation of picolines
AU Song, Zhaoxia; Matsushita, Toshiyuki; Shishido, Tetsuya; Takehira, Katsuomi
CS Department of Chemistry and Chemical Engineering, Graduate School of Engineering, Hiroshima University, Higashi-Hiroshima, 739-8527, Japan
SO Chemical Communications (Cambridge, United Kingdom) (2002), (12), 1306-1307
CODEN: CHCOFS; ISSN: 1359-7345
PB Royal Society of Chemistry
DT Journal
LA English

OS CASREACT 137:352468

AB Calcinated CrV0.95P0.05O4 prepared as a pure crystalline form was found to be highly active for the vapor-phase oxidation of picolines to the corresponding aldehydes and acids in the presence of water.

CC 21-2 (General Organic Chemistry)
Section cross-reference(s): 22, 67

ST chromium vanadium phosphor oxide **catalyst** vapor phase
oxidn picoline

IT Oxidation
Oxidation **catalysts**
(gas-phase; activities of calcinated crystalline chromium-vanadium-phosphor oxide **catalysts** for vapor-phase oxidation of picolines)

IT 7789-04-0, Chromium phosphate (CrPO4) 13548-45-3, Chromium vanadium oxide (CrVO4) 474900-65-7, Chromium vanadium oxide **phosphate** (CrV0.98O3.92(PO4)0.02) 474900-66-8, Chromium vanadium oxide **phosphate** (CrV0.95O3.8(PO4)0.05) 474900-67-9, Chromium vanadium oxide **phosphate** (CrV0.90O3.6(PO4)0.1) 474900-68-0, Chromium vanadium oxide **phosphate** (CrV0.75O3(PO4)0.25) 474900-69-1, Chromium vanadium oxide **phosphate** (CrV0.50O2(PO4)0.5)
RL: CAT (Catalyst use); USES (Uses)
(activities of calcinated crystalline chromium-vanadium-phosphor oxide **catalysts** for vapor-phase oxidation of picolines)

IT 108-89-4, 4-Picoline 108-99-6, 3-Picoline 109-06-8, 2-Picoline
RL: RCT (Reactant); RACT (Reactant or reagent)
(activities of calcinated crystalline chromium-vanadium-phosphor oxide **catalysts** for vapor-phase oxidation of picolines)

IT 55-22-1P, Isonicotinic acid, preparation 59-67-6P, Nicotinic acid, preparation 500-22-1P, Pyridine-3-carbaldehyde 872-85-5P, Pyridine-4-carbaldehyde 1121-60-4P, 2-Pyridinecarboxaldehyde
RL: SPN (Synthetic preparation); PREP (Preparation)
(activities of calcinated crystalline chromium-vanadium-phosphor oxide **catalysts** for vapor-phase oxidation of picolines)

IT 124-38-9P, Carbon dioxide, preparation
RL: BYP (Byproduct); PREP (Preparation)
(byproduct; activities of calcinated crystalline chromium-vanadium-phosphor oxide **catalysts** for vapor-phase oxidation of picolines)

IT 13463-67-7, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** support; activities of calcinated crystalline

chromium-vanadium-phosphor oxide **catalysts** for
vapor-phase oxidation of picolines)

IT 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(effect of water on activities of calcinated crystalline
chromium-vanadium-phosphor oxide **catalysts** for
vapor-phase oxidation of picolines)

IT 110-86-1P, Pyridine, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(trace product; activities of calcinated crystalline
chromium-vanadium-phosphor oxide **catalysts** for
vapor-phase oxidation of picolines)

OSC.G 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5
CITINGS)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 10 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1998:667183 HCAPLUS Full-text
DN 130:24630
TI **Vanadium phosphates**: a new type of heterogeneous
catalyst for the liquid phase oxidation of hydrocarbons and
their derivatives
AU Zazhigalov, V. A.; Gansior, M.; Vartikyan, L.; Podobinski, E.;
Bacherikova, I. V.
CS L. V. Pisarzhevskii Institute of Physical Chemistry, Academy of
Sciences of Ukraine, Kiev, 252039, Ukraine
SO Theoretical and Experimental Chemistry (Translation of
Teoreticheskaya i Eksperimental'naya Khimiya) (1998),
34(1), 41-43
CODEN: TEXCAK; ISSN: 0040-5760
PB Consultants Bureau
DT Journal
LA English
AB The activity of **vanadium phosphates** in the liquid phase oxidation of
10 hydrocarbons and their derivs. (benzene, phenol, toluene,
naphthalene, naphthol, α -, β - and γ -picolines, pyridine and
cyclohexanol) have been studied for the first time. The activity and
the composition of the oxidation products depend on both the phases
of the **vanadium phosphate** and the nature of the metals added to it.
A series of new compds. is formed, along with typical products of
liquid phase oxidation, with these **catalysts**.
CC 21-2 (General Organic Chemistry)
ST oxidn hydrocarbon **vanadium phosphate**
IT Oxidation
Oxidation **catalysts**
(liquid phase oxidation of hydrocarbons and their derivs.)

catalyzed by vanadium phosphates)

IT Hydrocarbons, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (liquid phase oxidation of hydrocarbons and their derivs.
 catalyzed by vanadium phosphates)

IT 12359-27-2 58834-75-6 93280-40-1 96150-43-5, Cesium
 vanadium oxide phosphate 96150-54-8,
 Vanadium zinc oxide phosphate 169314-64-1,
 Bismuth phosphorus vanadium oxide 216446-29-6, Bismuth sodium
 vanadium oxide phosphate
 RL: CAT (Catalyst use); USES (Uses)
 (liquid phase oxidation of hydrocarbons and their derivs.
 catalyzed by vanadium phosphates)

IT 71-43-2, Benzene, reactions 91-20-3, Naphthalene, reactions
 108-88-3, Toluene, reactions 108-89-4 108-93-0, Cyclohexanol,
 reactions 108-99-6 109-06-8 110-86-1, Pyridine,
 reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (liquid phase oxidation of hydrocarbons and their derivs.
 catalyzed by vanadium phosphates)

IT 90-15-3P, α -Naphthol 108-95-2P, Phenol, preparation
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
 RACT (Reactant or reagent)
 (liquid phase oxidation of hydrocarbons and their derivs.
 catalyzed by vanadium phosphates)

IT 100-52-7P, Benzaldehyde, preparation 108-94-1P, Cyclohexanone,
 preparation 130-15-4P, 1,4-Naphthoquinone 694-59-7P, Pyridine
 N-oxide 931-19-1P, α -Picoline N-oxide 1003-67-4P,
 γ -Picoline N-oxide 1003-73-2P, β -Picoline N-oxide
 1319-77-3P, Cresol 1320-69-0P 54774-79-7P, Phenol, phenoxy
 216483-95-3P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (liquid phase oxidation of hydrocarbons and their derivs.
 catalyzed by vanadium phosphates)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1
 CITINGS)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 11 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1998:133350 HCAPLUS Full-text
 DN 128:168961
 OREF 128:33281a,33284a
 TI Ammoxidation of 3-picoline to nicotinonitrile
 over vanadium phosphorus oxide-based catalysts
 AU Manohar, Basude; Reddy, Benjaram M.
 CS Inorganic Chemistry Division, Indian Institute of Chemical

- Technology, Hyderabad, 500 007, India
- SO Journal of Chemical Technology & Biotechnology (1998),
71(2), 141-146
CODEN: JCTBED; ISSN: 0268-2575
- PB John Wiley & Sons Ltd.
- DT Journal
- LA English
- AB Ammoxidn. of 3-picoline to nicotinonitrile was investigated on vanadium phosphorus oxide (VPO), VPO/SiO₂ and additive atom (Cu, Zr, Mn, and Co)-incorporated VPO catalysts under atmospheric pressure at 673 K. For comparison, a conventional V₂O₅-MoO₃/Al₂O₃ catalyst was also studied under identical conditions. These catalysts were characterized by means of X-ray diffraction, ESR, IR, ammonia chemisorption, and BET surface area methods. The VPO-based catalysts show better performance than the V₂O₅-MoO₃/Al₂O₃ catalyst. Further, the VPO/SiO₂ and VPO catalysts exhibit better conversion and product selectivities than the additive-containing VPO catalysts. Better activity of VPO and VPO/SiO₂ catalysts was related to their high active surface area, higher surface acidity, and lower oxidation state of vanadium. The redox couple between (VO)₂P₂O₇ (V⁴⁺) and α-VPO₄ (V⁵⁺) phases appears to be responsible for the ammoxidn. activity of VPO catalysts.
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
- ST picoline ammoxidn nicotinonitrile selectivity; catalyst
ammoxidn vanadium phosphorus oxide
- IT Ammoxidation catalysts
(vanadium phosphorus oxide-based catalysts for
ammoxidn. of 3-picoline)
- IT 7439-96-5, Manganese, uses 7440-48-4, Cobalt, uses 7440-50-8,
Copper, uses 7440-67-7, Zirconium, uses
RL: CAT (Catalyst use); USES (Uses)
(in vanadium phosphorus oxide-based catalysts for
ammoxidn. of 3-picoline)
- IT 7631-86-9, Silica, uses
RL: CAT (Catalyst use); USES (Uses)
(supports; vanadium phosphorus oxide-based catalysts
for ammoxidn. of 3-picoline)
- IT 12359-27-2 58834-75-6
RL: CAT (Catalyst use); USES (Uses)
(vanadium phosphorus oxide-based catalysts for
ammoxidn. of 3-picoline)
- IT 100-54-9P, Nicotinonitrile
RL: IMF (Industrial manufacture); PREP (Preparation)
(vanadium phosphorus oxide-based catalysts for
ammoxidn. of 3-picoline to)
- IT 108-99-6, 3-Picoline

RL: RCT (Reactant); RACT (Reactant or reagent)
(vanadium phosphorus oxide-based **catalysts** for
ammoxidn. to nicotinonitrile)

OSC.G 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4
CITINGS)

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 12 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1996:40762 HCAPLUS Full-text

DN 124:98937

OREF 124:18281a,18284a

TI Oxidation and ammoxidation of picolines over **vanadium**
-silico-alumino-phosphate molecular sieves

AU Kulkarni, S J.; Rao, R Ramachandra; Subrahmanyam, M.; Farsinavis,
S.; Rao, P Kanta; Rao, A V Rama

CS Indian Institute Chemical Technology, Hyderabad, 500 007, India

SO Studies in Surface Science and Catalysis (1995),
98(Zeolite Science 1994: Recent Progress and Discussions), 161-2
CODEN: SSCTDM; ISSN: 0167-2991

PB Elsevier

DT Journal

LA English

AB The oxidation and ammoxidn. of 3- and 4-picolines over **vanadium**
silico-alumino-phosphate and **vanadium-alumino-phosphate** mol. sieves
lead to corresponding 60-85% yields of aldehydes and nitriles. We
report crystalline and microporous modified (V-) **silico-alumino-**
phosphates as a new class of oxidation and ammoxidn. **catalytic**
materials.

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction
Mechanisms)

Section cross-reference(s): 22, 27

ST oxidn ammoxidn picoline vanadium silicoaluminophosphate
catalyst; aluminophosphate vanadium **catalyst** oxidn
ammoxidn picoline; VSAPO **catalyst** oxidn ammoxidn picoline;
VAPO **catalyst** oxidn ammoxidn picoline

IT Ammoxidation

(mechanism; oxidation and ammoxidn. of picolines over
vanadium-silico-alumino-phosphate mol. sieves)

IT Ammoxidation **catalysts**

Oxidation **catalysts**

(oxidation and ammoxidn. of picolines over **vanadium**
-silico-alumino-phosphate mol. sieves)

IT Zeolites, uses

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)

(vanadium silicoaluminophosphate; oxidation and ammoxidn. of
picolines over **vanadium-silico-alumino-**

phosphate mol. sieves)

IT Zeolites, uses
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (vanadium aluminophosphate (VAPO), oxidation and ammoxidn. of
 picolines over vanadium-silico-alumino-
 phosphate mol. sieves)

IT 108-89-4, 4-Picoline 108-99-6, 3-
 Picoline
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidation and ammoxidn. of picolines over vanadium
 -silico-alumino-phosphate mol. sieves)

OSC.G 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7
 CITINGS)

L44 ANSWER 13 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1995:534201 HCAPLUS Full-text
 DN 123:83313
 OREF 123:14909a,14912a

TI Vanadium phosphorus oxide catalyst for ammoxidations of
 3-picoline to nicotinonitrile and 2-methylpyrazine
 to 2-cyanopyrazine

AU Reddy, B. Mahipal; Kumar, M. Vijaya; Manohar, B.
 CS Indian Institute Chemical Technology, Hyderabad, 500 007, India
 SO Chemical Industries (Dekker) (1995), 62(Catalysis of
 Organic Reactions), 487-91
 CODEN: CHEIDI; ISSN: 0737-8025

PB Dekker
 DT Journal
 LA English

AB Ammoxidns. of 3-picoline to nicotinonitrile and 2-methylpyrazine to
 2-cyanopyrazine were investigated both on conventional molybdena-
 vanadia/alumina catalyst and on non-conventional vanadium phosphorus
 oxides (VPOs) of different origin. The VPO catalyst supported on
 silica shows good performance. The catalytic activity is correlated
 well with the physicochem. characteristics of the catalyst.

CC 28-17 (Heterocyclic Compounds (More Than One Hetero Atom))
 Section cross-reference(s): 27, 67

ST ammoxidn catalyst vanadium phosphorus oxide; picoline
 ammoxidn catalyst; methylpyrazine ammoxidn
 catalyst; nicotinonitrile; pyrazine cyano

IT Ammoxidation catalysts
 (vanadium phosphorus oxide catalyst for ammoxidns. of
 picoline to nicotinonitrile and methylpyrazine to cyanopyrazine)

IT 65506-75-4, Vanadium phosphorus oxide
 RL: CAT (Catalyst use); USES (Uses)
 (vanadium phosphorus oxide catalyst for ammoxidns. of
 picoline to nicotinonitrile and methylpyrazine to cyanopyrazine)

IT 108-99-6, 3-Picoline 109-08-0,
 2-Methylpyrazine
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (vanadium phosphorus oxide **catalyst** for ammoxidns. of
 picoline to nicotinonitrile and methylpyrazine to cyanopyrazine)
 IT 100-54-9P, Nicotinonitrile 19847-12-2P, 2-Cyanopyrazine
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (vanadium phosphorus oxide **catalyst** for ammoxidns. of
 picoline to nicotinonitrile and methylpyrazine to cyanopyrazine)
 OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1
 CITINGS)

L44 ANSWER 14 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1992:255487 HCAPLUS Full-text
 DN 116:255487
 OREF 116:43315a,43318a
 TI Ammoxidation of methyl substituted heteroaromatics to make
 heteroaromatic nitriles
 IN Dicosimo, Robert; Burrington, James D.; Grasselli, Robert K.
 PA Standard Oil Co., USA
 SO U.S., 4 pp. Cont.-in-part of U.S. Ser. No. 559,511, abandoned.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 5028713	A	19910702	US 1986-925932	198611 03

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PRAI US 1983-559511 B2 19831208 <--
 ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
 OS CASREACT 116:255487
 AB Ammoxidn. **catalysts** for 3- and 4-methylpyridine have the formula
 PaVbMocMdOx ($M = \text{Sb, Fe, W, Cu, K, Cs, Sn, Mn, Zr, Nb, U, Bi, Cr}$; $a = 0.1-3$; $b = 0.1-6$; $a + b \geq 1.5$; $c = 12$; $d = 0-4$; $x = \text{atoms required to satisfy the valences of the other elements}$). The **catalysts** may also contain 0-0.2 atoms of Te, Se, and/or Zr and 0-0.5 atoms of Fe, Co, or Ni. Thus, PV4Mo12Ox on SiO_2 was prepared from NH_4VO_3 , H_3PO_4 , and $(\text{NH}_4)_5\text{Mo}_7\text{O}_{24}$ and was used for the ammoxidn. of 3-methylpyridine at 380° with a residence time of 2.5 s. to give 95% 3-cyanopyridine at 99% conversion.
 IC ICM C07D213-57
 INCL 546286000
 CC 27-16 (Heterocyclic Compounds (One Hetero Atom))

ST methylpyridine ammoxidn molybdenum **catalyst**; cyanopyridine
IT Ammoxidation **catalysts**
(for methylpyridines)
IT 108-89-4, 4-Methylpyridine 108-99-6, 3-Methylpyridine
RL: PROC (Process)
(ammoxidn. of, **catalysts** for)
IT 128177-07-1 156166-12-0, Molybdenum vanadium oxide
phosphate
RL: CAT (Catalyst use); USES (Uses)
(**catalyst**, for ammoxidn. of Me pyridines)
IT 100-48-1P, 4-Cyanopyridine 100-54-9P, 3-Cyanopyridine
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, from methylpyridine, **catalysts** for)
OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3
CITINGS)
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 15 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1992:154188 HCAPLUS Full-text
DN 116:154188
OREF 116:26081a,26084a
TI Ammoxidation of 3-picoline to nicotinonitrile on
silica-supported vanadium phosphorus oxide (VPO)
catalyst
AU Reddy, Benjaram M.; Manohar, Basude
CS Catal. Sect., Indian Inst. Chem. Technol., Hyderabad, 500 007, India
SO Chemistry & Industry (London, United Kingdom) (1992), (5),
182-3
CODEN: CHINAG; ISSN: 0009-3068
DT Journal
LA English
AB The title ammoxidn. over VPO/SiO2 **catalyst** at 1 atm and space
velocity 3946 h-1 occurred at 90% conversion and 93% selectivity,
compared to 42 and 81, 67 and 89, and 68 and 69% for aqueous VPO,
organic VPO, and MoO3-V2O5/Al2O3 **catalysts**, resp. The title **catalyst**
had average V oxidation state 4.33 and generally contained an
amorphous VPO phase and well crystallized (VO)2P2O7.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 27
ST ammoxidn picoline nicotinonitrile selectivity; vanadyl phosphate
catalyst ammoxidn
IT Ammoxidation **catalysts**
(vanadium phosphorus oxide, on silica, for picoline to
nicotinonitrile)
IT 108-99-6, 3-Picoline
RL: USES (Uses)

(ammoxidn. of, to nicotinonitrile, vanadium phosphorus oxide-silica **catalysts** for)

IT 58834-75-6 65506-75-4, Phosphorus vanadium oxide
 RL: CAT (Catalyst use); USES (Uses)
 (**catalysts**, on silica, for ammoxidn. of picoline to nicotinonitrile)

IT 100-54-9P, Nicotinonitrile
 RL: PREP (Preparation)
 (production of, by ammoxidn. of picoline, vanadium phosphorus oxide-silica **catalysts** for)

IT 7631-86-9, Silica, uses
 RL: USES (Uses)
 (vanadium phosphorus oxide **catalysts** containing, for ammoxidn. of picoline to nicotinonitrile)

OSC.G 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

L44 ANSWER 16 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1990:559889 HCAPLUS Full-text

DN 113:159889

OREF 113:27043a,27046a

TI Methods for preparing **vanadium phosphate** heterogeneous **catalysts**

IN Martin, Andreas; Ladwig, Gerhard; Luecke, Bernhard; Seeboth, Helmuth

PA Akademie der Wissenschaften der DDR, Ger. Dem. Rep.

SO Ger. (East), 5 pp.

CODEN: GEXXA8

DT **Patent**

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	DD 274983	A1	19900110	DD 1987-311018	19871222

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PRAI DD 1987-311018 19871222 <--

OS CASREACT 113:159889

AB Methods for producing **catalysts** containing $(\text{NH}_4)_2(\text{VO})_3(\text{P}_2\text{O}_7)$, which are useful in the manufacture of aromatic and heteroarom. nitriles by gas-phase ammoxidn. of Me aroms. and Me heteroaroms., entail producing the crystalline intermediate $(\text{NH}_4)_2(\text{VO}_2)(\text{HPO}_4)_2(\text{C}_2\text{O}_4) \cdot n\text{H}_2\text{O}$ ($n = 0-5$), by carrying out a redox reaction involving a V+5 compound in a heated aqueous solution in the presence of phosphoric and oxalic acids with the addition of NH_3 , and then heat-treating the intermediate in a Me aromatic and/or Me heteroarom. compound-, O-,

and optionally steam-containing gas flow at 250-600° to produce the catalyst.

- IC ICM B01J027-198
ICS C07C120-14
- CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 25, 45
- ST ammoxidn catalyst prepn; ammonium oxovanadium diphosphate catalyst prepn; vanadium phosphate catalyst prepn; heterogeneous catalyst prepn
- IT Ammoxidation catalysts
(ammonium oxovanadium diphosphate, preparation of)
- IT Nitriles, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(aromatic and heteroarom., preparation of, vanadium phosphate catalyst preparation for)
- IT Catalysts and Catalysis
(heterogeneous, ammonium oxovanadium diphosphate, preparation of)
- IT 95-49-8 106-38-7 106-43-4, p-Chlorotoluene 108-88-3, reactions
108-89-4 108-99-6, 3-Picoline
RL: RCT (Reactant); RACT (Reactant or reagent)
(ammoxidn. of, preparation of catalyst for)
- IT 129496-78-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(preparation and reaction of, in ammonium oxovanadium diphosphate catalyst preparation)
- IT 110779-76-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as heterogeneous catalyst)
- IT 623-03-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, by ammoxidn., preparation of catalyst for)
- IT 144-62-7, Ethanedioic acid, reactions 1314-62-1, Vanadium oxide (V2O5), reactions 7664-38-2, Phosphoric acid, reactions 7664-41-7, Ammonia, reactions 7803-55-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, in ammonium oxovanadium diphosphate catalyst preparation)
- L44 ANSWER 17 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1989:459953 HCAPLUS Full-text
DN 111:59953
OREF 111:10165a,10168a
TI Ammoxidation of picolines on vanadium phosphate catalysts
AU Martin, A.; Luecke, B.; Seeboth, H.; Ladwig, G.

CS Cent. Inst. Org. Chem., Acad. Sci., Berlin, 1199, Ger. Dem. Rep.
SO Applied Catalysis (1989), 49(2), 205-11
CODEN: APCADI; ISSN: 0166-9834
DT Journal
LA English
AB The ammoxidn. of the three isomeric picolines to cyanopyridines on crystalline V phosphate **catalysts** was investigated. α -VOP₄ was used as the **catalyst** precursor; it was transformed into a highly active **catalyst** during the time onstream. In the optimum temperature range a high picoline conversion with high selectivities of the generated nitriles was observed
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
ST picoline ammoxidn cyanopyridine prodn; vanadyl phosphate **catalyst** ammoxidn
IT Ammoxidation **catalysts**
(vanadyl phosphate, for picolines, optimization in relation to)
IT 108-89-4, 4-Picoline 108-99-6, 3-Picoline 109-06-8, 2-Picoline
RL: PROC (Process)
(ammoxidn. of, to cyanopyridine, vanadyl phosphate **catalysts** for)
IT 12359-27-2, Vanadyl phosphate (VOP₄)
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**, for ammoxidn. of picolines to cyanopyridines)
IT 100-48-1P, 4-Cyanopyridine 100-54-9P, 3-Cyanopyridine 100-70-9P, 2-Cyanopyridine
RL: PREP (Preparation)
(production of, by ammoxidn. of picoline, vanadyl phosphate **catalysts** for)
OSC.G 34 THERE ARE 34 CAPLUS RECORDS THAT CITE THIS RECORD (34 CITINGS)

L44 ANSWER 18 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 1989:233611 HCAPLUS Full-text
DN 110:233611
OREF 110:38732h,38733a
TI Ammoxidation **catalysts** for manufacture of aromatic and hetero aromatic nitriles from methyl-substituted precursors
IN Luecke, Bernhard; Martin, Andreas; Seeboth, Helmuth; Ladwig, Gerhard; Parlitz, Barbara; French, Juergen
PA Akademie der Wissenschaften der DDR, Ger. Dem. Rep.
SO Ger. (East), 6 pp.
CODEN: GEXXA8
DT **Patent**
LA German
FAN.CNT 1

	PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
PI	DD 256129	A1	19880427	DD 1985-274902	198504 04
				<--	
PRAI	DD 1985-274902		19850404	<--	
AB	The title catalysts contain a V phosphate such as (NH ₄) ₂ (VO) ₃ (P ₂ O ₇) ₂ or (VO) ₂ P ₂ O ₇ and give high product yields and space-time yields. Tablets containing VOPO ₄ .2H ₂ O were heated in air at 200° to remove water of hydration, placed in a tubular reactor, and used at 440° (residence time 1.0 s) for the ammoxidn. of p-methoxytoluene, giving 89.9% conversion with a 67.6% yield of p-methoxybenzonitrile and a space-time yield of 62.0 g/L catalyst /h.				
IC	ICM C07C120-14 ICS B01J027-18; C07C121-52; C07D213-84				
CC	45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes) Section cross-reference(s): 25, 27				
ST	nitrile manuf ammoxidn catalyst ; benzonitrile manuf toluene ammoxidn; heterocycle nitrile manuf ammoxidn; vanadium phosphate ammoxidn catalyst				
IT	Ammoxidation catalysts (vanadium phosphates , for methylarenes to nitriles)				
IT	Nitriles, preparation RL: PREP (Preparation) (aryl, manufacture of, ammoxidn. catalysts for)				
IT	Nitriles, preparation RL: PREP (Preparation) (heterocyclic, manufacture of, ammoxidn. catalysts for)				
IT	95-49-8, 2-Chlorotoluene 100-84-5, m-Methoxytoluene 104-93-8, 4-Methoxytoluene 106-38-7, 4-Bromotoluene 106-43-4, 4-Chlorotoluene 108-41-8, 3-Chlorotoluene 108-88-3, Toluene, reactions 108-89-4, 4-Picoline 108-99-6, 3- Picoline 109-06-8 578-58-5, o-Methoxytoluene RL: PROC (Process) (ammoxidn. of, to nitrile)				
IT	12054-39-6 12359-27-2 45021-28-1 58834-75-6 70599-09-6 109799-88-4 110779-76-5 RL: CAT (Catalyst use); USES (Uses) (catalysts , for ammoxidn. of methylarenes to nitriles)				
IT	100-47-0P, Benzonitrile, preparation 100-48-1P, 4-Cyanopyridine 100-54-9P, 3-Cyanopyridine 100-70-9P, 2-Cyanopyridine 623-00-7P, 4-Bromobenzonitrile 623-03-0P, 4-Chlorobenzonitrile 766-84-7P, 3-Chlorobenzonitrile 873-32-5P, 2-Chlorobenzonitrile 874-90-8P, 4-Methoxybenzonitrile 1527-89-5P, 3-Methoxybenzonitrile				

6609-56-9P, 2-Methoxybenzonitrile

RL: PREP (Preparation)

(manufacture of, ammoxidn. catalysts for)

L44 ANSWER 19 OF 20 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1988:454666 HCAPLUS Full-text

DN 109:54666

OREF 109:9215a,9218a

TI Process for preparing heteroaromatic nitriles useful as starting materials for preparation of medicines or agricultural chemicals

IN Shimizu, Shinkichi; Shoji, Takayuki; Abe, Nobuyuki; Doba, Masanori; Taguro, Akira; Iguchi, Akira; Nakaishi, Toru

PA Koei Chemical Co., Ltd., Japan

SO Eur. Pat. Appl., 18 pp.

CODEN: EPXXDW

DT ~~Patent~~

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	EP 253360	A2	19880120	EP 1987-110158	198707 14
				<--	
	EP 253360	A3	19890503		
	EP 253360	B1	19931201		
	R: BE, DE, IT				
	JP 63072675	A	19880402	JP 1986-218485	198609 16
				<--	
	JP 63152360	A	19880624	JP 1987-176888	198707 15
				<--	
	JP 07049419	B	19950531		
	US 4778890	A	19881018	US 1987-75037	198707 16
				<--	
PRAI	JP 1986-165767	A	19860715	<--	
	JP 1986-183255	A	19860804	<--	
	JP 1986-218485	A	19860916	<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS CASREACT 109:54666

AB The title compds. were prepared by **catalytically** subjecting an alkyl-substituted heteroarom. compound to ammoxidn. ($\text{O}_2\text{-NH}_3 = 1.6:1$ in a gaseous phase). The **catalyst**, a vanadium-phosphorus oxide $\text{VP}_x\text{Sb}_y\text{O}_z$ (I; x, y, z is the atomic ratio of P, Sb, and O to V, resp., and x = 0.1-5, y = 0-8, and z is defined from the valencies of other elements) was also prepared. NH_4VO_3 in H_2O and 85% H_3PO_4 were reacted at 110° for 8 h, followed by calcination at 500° for 4 h in the air to give $\beta\text{-VOPO}_4$. Heating $\beta\text{-VOPO}_4$ in a reactor at 420° , a gaseous mixture of 4-methylpyridine, NH_3 , air and steam (molar ratio = 1:15:75:10) was flowed at a space velocity of 3000 h^{-1} to give 4-cyanopyridine 81.5% and a conversion of 4-methylpyridine 99.4%.

IC ICM C07D213-84
ICS C07D241-24

CC 27-16 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 1, 5, 28, 67

ST heteroarom nitrile; alkylpyridine ammoxidn **catalyst**
nitriloheteroarom; nitriloheteroarom prepn intermediate agrochem
pharmaceutical; pyridinenitrile prepn intermediate agrochem
pharmaceutical; pyrazinenitrile prepn intermediate agrochem

IT Ammoxidation **catalysts**
(vanadium-phosphorus oxide, for alkylpyrazines and -pyridines)

IT 108-89-4, 4-Methylpyridine 108-99-6, 3-Methylpyridine
109-06-8, 2-Methylpyridine 109-08-0, Methylpyrazine 591-22-0,
3,5-Dimethylpyridine
RL: PROC (Process)
(ammoxidn. of, **catalysts** for)

IT 12293-87-7P 12359-27-2P 58834-75-6P 115493-46-4P, Antimony
vanadium oxide **phosphate** ($\text{Sb}_2\text{VO}_4 \cdot 2.2(\text{PO}_4) \cdot 0.85$)
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as ammoxidn. **catalysts**, for heteroarom.
nitriles)

IT 1309-64-4, Antimony trioxide, reactions 7664-38-2, Phosphoric
acid, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with ammonium metavanadate, **catalysts**
from)

IT 1314-62-1, Vanadium pentoxide, reactions 7803-55-6, Ammonium
metavanadate
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with phosphoric acid, **catalysts** from)

IT 7722-76-1, Ammonium dihydrogen phosphate
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with vanadium pentoxide, **catalysts** from)

OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3
CITINGS)

AN 1983:52937 HCAPLUS Full-text
 DN 98:52937
 OREF 98:8125a,8128a
 TI Characteristics of the mechanism of vapor-phase oxidation of
 methylpyridines on **vanadium phosphates**
 AU Skolmeistere, R. A.; Leitis, L.; Shimanskaya, M. V.; Geodrovics, J.;
 Konstants, Z.
 CS USSR
 SO Mekhanizm Katalit. Reaktsii. Materialy 3 Vses. Konf., Novosibirsk (
 1982), (Ch 2), 164-7
 From: Ref. Zh., Khim. 1982, Abstr. No. 20B1156
 DT Journal
 LA Russian
 AB Title only translated.
 CC 22-7 (Physical Organic Chemistry)
 Section cross-reference(s): 67
 IT Oxidation **catalysts**
 (vanadium polyphosphates, for methylpyridines)
 IT Polyphosphoric acids
 RL: PRP (Properties)
 (vanadium salts, **catalysts**, for oxidation of
 methylpyridines)
 IT 7440-62-2D, polyphosphates
 RL: CAT (Catalyst use); USES (Uses)
 (**catalysts**, for oxidation of methylpyridines)
 IT 108-89-4 108-99-6 109-06-8
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidation of, on vanadium polyphosphates, mechanism of)

=> d 147 1-4 bib abs fhitr hitind

L47 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2004:718421 HCAPLUS Full-text

DN 141:224880

TI **Catalyst** for methacrylic acid synthesis

IN Sudo, Atsushi; Seo, Yoshimasa; Sugi, Hideki

PA Nippon Kayaku Kabushiki Kaisha, Japan

SO PCT Int. Appl., 53 pp.

CODEN: PIXXD2

DT **Patent**

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 2004073857	A1	20040902	WO 2004-JP1999	

200402
20

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NA, NI

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT,
BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,
IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI,
CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1595600 A1 20051116 EP 2004-713199

200402
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,
SK

BR 2004007442 A 20060131 BR 2004-7442

200402
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CN 1750878 A 20060322 CN 2004-80004485

200402
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CN 100457264 C 20090204
MX 2005008754 A 20051005 MX 2005-8754

200508
17

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ZA 2005007363 A 20061025 ZA 2005-7363

200509
13

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US 20060154811 A1 20060713 US 2005-545699

200510
03

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PRAI JP 2003-42259 A 20030220 <--
WO 2004-JP1999 W 20040220 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The invention refers to a **catalyst** for producing methacrylic acid in a high yield with high selectivity by **catalytically** oxidizing methacrolein, isobutyraldehyde, or isobutyric acid in a vapor phase. The **catalyst** comprises a heteropolyacid salt comprising a

heteropolyacid containing Mo, V, P, Cu, Cs, and NH₄ as essential active ingredients. A weak-acid salt of Cs or CsOH was used as a source of Cs in the active **catalyst** ingredient and ammonium acetate was used as an NH₄ source. The coated **catalyst** was obtained by supporting the active ingredient on an inactive **support** such as **alumina**.

IT 182616-75-7, Ammonium cesium copper molybdenum phosphorus vanadium oxide
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (catalyst for methacrylic acid synthesis)
 RN 182616-75-7 HCAPLUS
 CN Ammonium cesium copper molybdenum phosphorus vanadium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
H4N	x	14798-03-9
P	x	7723-14-0
V	x	7440-62-2
Cu	x	7440-50-8
Cs	x	7440-46-2
Mo	x	7439-98-7

IC ICM B01J027-24
 ICS B01J037-08; B01J037-16; C07C057-05; C07C051-235; C07C051-377
 CC 21-2 (General Organic Chemistry)
 Section cross-reference(s): 67
 ST oxidn **catalyst** heteropolyacid molybdenum vanadium phosphorus copper cesium ammonium; methacrylic acid synthesis
catalyst heteropoly acid salt
 IT Oxidation **catalysts**
 (catalyst for methacrylic acid synthesis)
 IT Heteropoly acids
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (catalyst for methacrylic acid synthesis)
 IT Ceramics
 (fibers; **catalyst** for methacrylic acid synthesis)
 IT 1344-28-1, Alumina, uses 182616-75-7, Ammonium cesium copper molybdenum phosphorus vanadium oxide 745828-67-5
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (catalyst for methacrylic acid synthesis)
 IT 79-41-4P, Methacrylic acid, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (catalyst for methacrylic acid synthesis)
 OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (2

CITINGS)

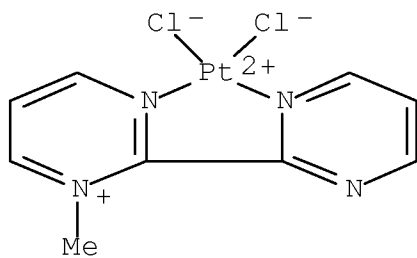
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
AN 2004:607057 HCAPLUS Full-text
DN 141:297626
TI Mild, Aqueous, Aerobic, Catalytic Oxidation of Methane to
Methanol and Acetaldehyde Catalyzed by a Supported
Bipyrimidinylplatinum-Polyoxometalate Hybrid Compound
AU Bar-Nahum, Itsik; Khenkin, Alexander M.; Neumann, Ronny
CS Department of Organic Chemistry, Weizmann Institute of Science,
Rehovot, 76100, Israel
SO Journal of the American Chemical Society (2004), 126(33),
10236-10237
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society
DT Journal
LA English
OS CASREACT 141:297626
AB A bipyrimidinylplatinum-polyoxometalate,
[Pt(Mebipym)Cl₂]+[H₄PV₂Mo₁₀O₄₀]-, supported on silica is demonstrated
as an active catalyst for the aerobic oxidation of methane to
methanol in water under mild reaction conditions. Further oxidation
of methanol yields acetaldehyde. The presence of the polyoxometalate
is presumed to allow the facile oxidation of a Pt(II) intermediate to
a Pt(IV) intermediate and to aid in the addition of methane to the Pt
catalytic center.
IT 763114-87-0P
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(synthesis of a supported bipyrimidinylplatinum-polyoxometalate
hybrid compound for aerobic catalytic oxidation of methane)
RN 763114-87-0 HCAPLUS
CN Platinum(1+), dichloro(1-methyl-2,2'-bipyrimidinium-
κN1', κN3)-, (SP-4-3)-, hydrogen
(heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ₁₂-
[phosphato(3-)-κO:κO:κO:κO':κO':..kappa
.O':κO':κO':κO':κO':κO':κO':κ
O''']]divanadate(5-) (1:4:1) (9CI) (CA INDEX NAME)

CM 1

CRN 845963-47-5
CMF C9H9 Cl2 N4 Pt
CCI CCS

10/566,868



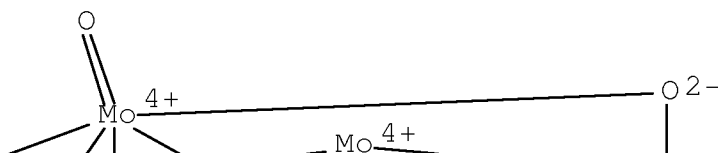
CM 2

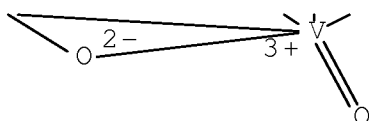
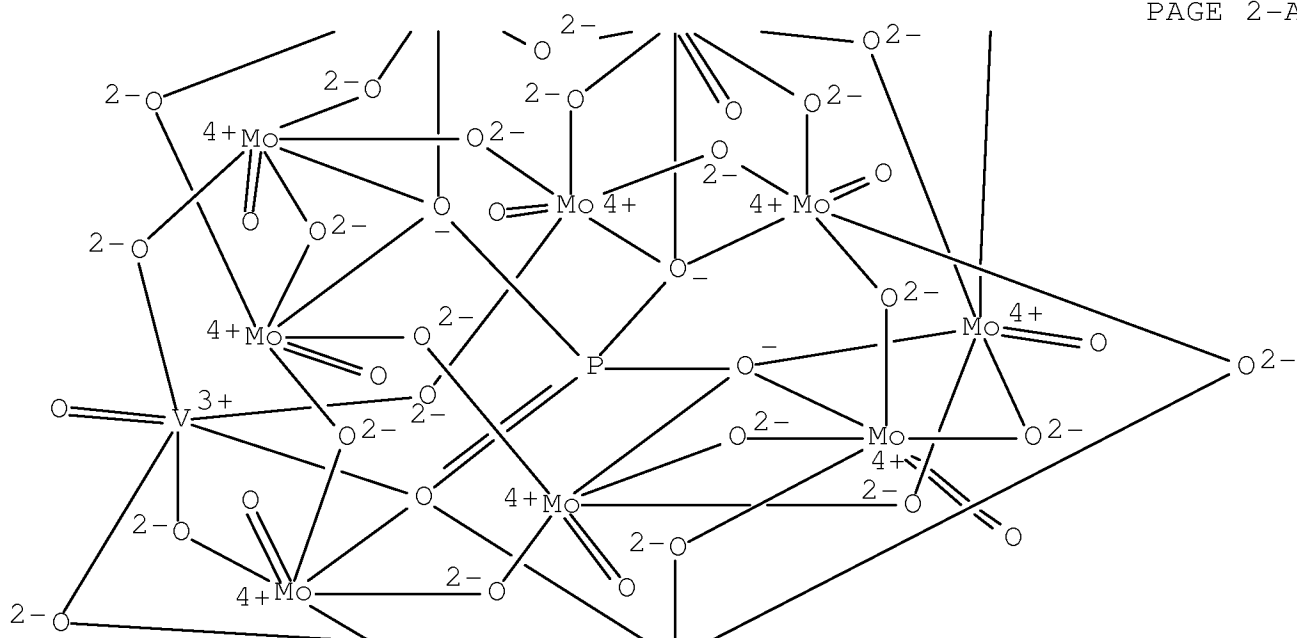
CRN 58071-93-5

CMF Mo10 O40 P V2

CCI CCS

PAGE 1-A





CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 22, 67, 78

ST bipyrimidinylplatinum polyoxometalate **catalyst** methane
 aerobic oxidn

IT Oxidation
 (aerobic **catalytic** oxidation of methane to methanol and
 acetaldehyde using a supported
 bipyrimidinylplatinum-polyoxometalate hybrid compound)

IT Transition metal complexes
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (imine; synthesis of a supported

bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT Oxidation **catalysts**
 (synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT Imines
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (transition metal complexes; synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT 67-56-1P, Methanol, preparation 75-07-0P, Acetaldehyde, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (aerobic **catalytic** oxidation of methane to methanol and acetaldehyde using a supported bipyrimidinylplatinum-polyoxometalate hybrid compound)

IT 74-82-8, Methane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (aerobic **catalytic** oxidation of methane to methanol and acetaldehyde using a supported bipyrimidinylplatinum-polyoxometalate hybrid compound)

IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); USES (Uses)
 (**catalyst support**; synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT 77-78-1, Dimethyl sulfate 12293-21-9 15274-33-6,
 Bis(dimethylsulfoxide)dichloroplatinum 34671-83-5,
 2,2'-Bipyrimidine
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT 763114-87-0P
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

IT 68976-09-0P 845963-48-6P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (synthesis of a supported bipyrimidinylplatinum-polyoxometalate hybrid compound for aerobic **catalytic** oxidation of methane)

OSC.G 47 THERE ARE 47 CAPLUS RECORDS THAT CITE THIS RECORD (47 CITINGS)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 2001:628616 HCAPLUS Full-text
 DN 135:195945
 TI Oxidative dehydrogenation **catalyst** of alkanes and
 manufacture of olefins and oxygenated compounds
 IN Fujikawa, Nobuo; Tomita, Koji; Aoki, Akinobu
 PA Idemitsu Petrochemical Co., Ltd., Japan; Japanese Association of
 Chemical Industries
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT **Patent**
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2001232207	A	20010828	JP 2000-47348	200002 24

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PRAI JP 2000-47348 20000224 <--
 AB The **catalyst** includes heteropoly acids or their salts supported on
 titania. A 1.5% H₃PMo₁₂O₄₀/TiO₂ **catalyst** was prepared and used for
 dehydrogenate propane at 380° to give propylene with 63.3%
 selectivity and 1.3% conversion.
 IT 356583-49-8
 RL: CAT (Catalyst use); USES (Uses)
 (heteropoly acid oxidative dehydrogenation **catalyst** of
 alkanes and manufacture of olefins and oxygenated compds.)
 RN 356583-49-8 HCAPLUS
 CN Molybdate(3-), tetracosam-μ-oxododecaoxo[μ₁₂-(phosphato(3-)-
 KO:KO:KO':KO':KO':KO':
 KO':KO':KO':KO':KO']dodeca-,
 ammonium vanadyl(2+) hydrogen (4:1:4:3) (9CI) (CA INDEX NAME)
 CM 1
 CRN 20644-97-7
 CMF O V
 CCI CCS

$$O \equiv V^{2+}$$

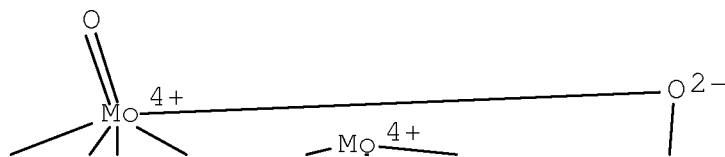
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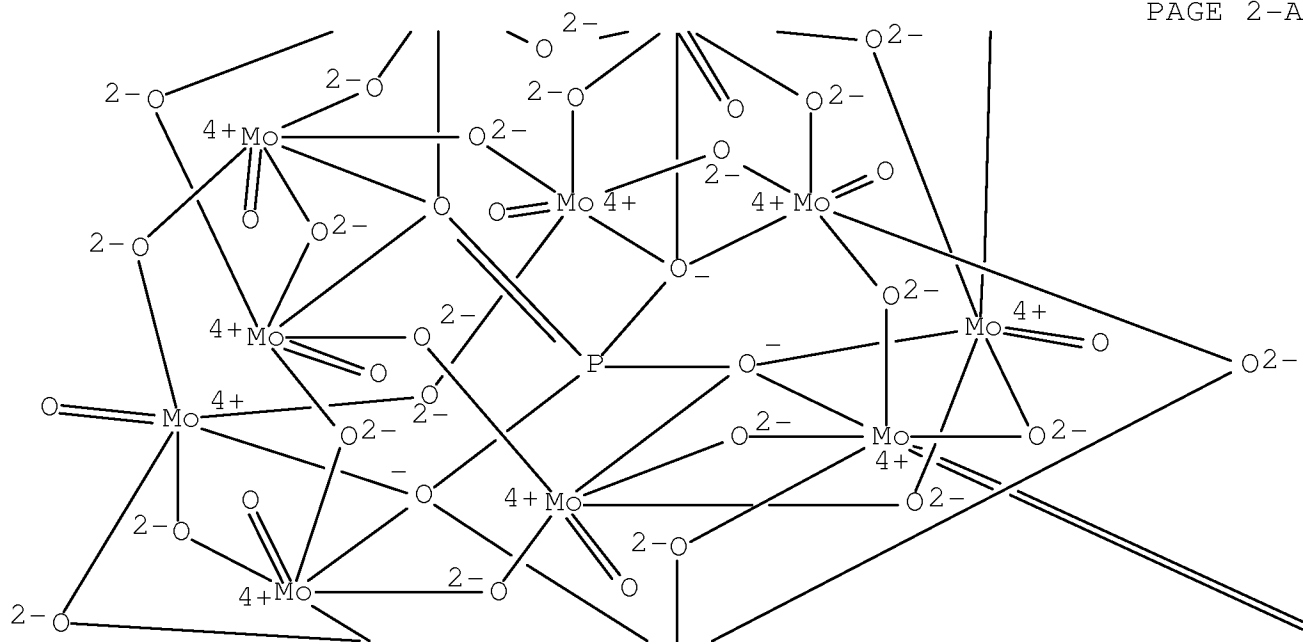
CRN 12379-13-4

CMF Mo12 O40 P

CCI CCS

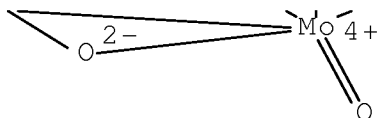
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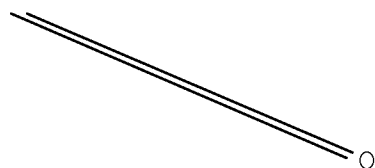


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PAGE 3-A



PAGE 3-B



IC ICM B01J027-19
 ICS B01J023-28; B01J027-199; B01J032-00; C07C005-48; C07C011-06;
 C07C027-12; C07C045-33; C07C047-22; C07C051-215; C07C053-08;
 C07C057-05; C07B061-00
 CC 35-3 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 45
 ST oxidative dehydrogenation **catalyst** alkane olefin
 oxygenate; propane dehydrogenation **catalyst** heteropoly
 acid propylene
 IT Heteropoly acids
 RL: CAT (Catalyst use); USES (Uses)
 (heteropoly acid oxidative dehydrogenation **catalyst** of
 alkanes and manufacture of olefins and oxygenated compds.)
 IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidative dehydrogenation **catalyst** of alkanes and
 manufacture of olefins and oxygenated compds.)
 IT Dehydrogenation **catalysts**
 (oxidative; oxidative dehydrogenation **catalyst** of
 alkanes and manufacture of olefins and oxygenated compds.)
 IT 12026-57-2, Phosphomolybdic acid (H3PMo12O40) 12027-12-2,
 Molybdosilicic acid (H4SiMo12O40) 12293-15-1,
 Molybdovanadophosphoric acid (H4Mo11PVO40) 159395-49-0

356583-49-8 356583-50-1

RL: CAT (Catalyst use); USES (Uses)

(heteropoly acid oxidative dehydrogenation **catalyst** of alkanes and manufacture of olefins and oxygenated compds.)

IT 64-19-7P, Acetic acid, preparation 75-07-0P, Acetaldehyde, preparation 79-10-7P, Acrylic acid, preparation 107-02-8P, 2-Propenal, preparation 115-07-1P, Propene, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(oxidative dehydrogenation **catalyst** of alkanes and manufacture of olefins and oxygenated compds.)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidative dehydrogenation **catalyst** of alkanes and manufacture of olefins and oxygenated compds.)

IT 13463-67-7, Titania, uses

RL: CAT (Catalyst use); USES (Uses)

(support; oxidative dehydrogenation **catalyst** of alkanes and manufacture of olefins and oxygenated compds.)

L47 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1997:789781 HCAPLUS Full-text

DN 128:27274

OREF 128:5265a,5268a

TI How does the support influence the **catalytic** activity of the Keggin ion?

AU Smith, Zakiiyyah; Palmieri, Michael; Buecheler, Nancy; Jansen, Susan A.

CS Department of Chemistry, Temple University, Philadelphia, PA, 19122, USA

SO Materials Research Society Symposium Proceedings (1997), 454(Advanced Catalytic Materials--1996), 103-110

CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

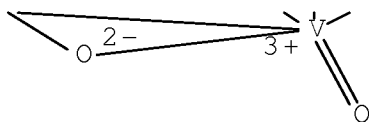
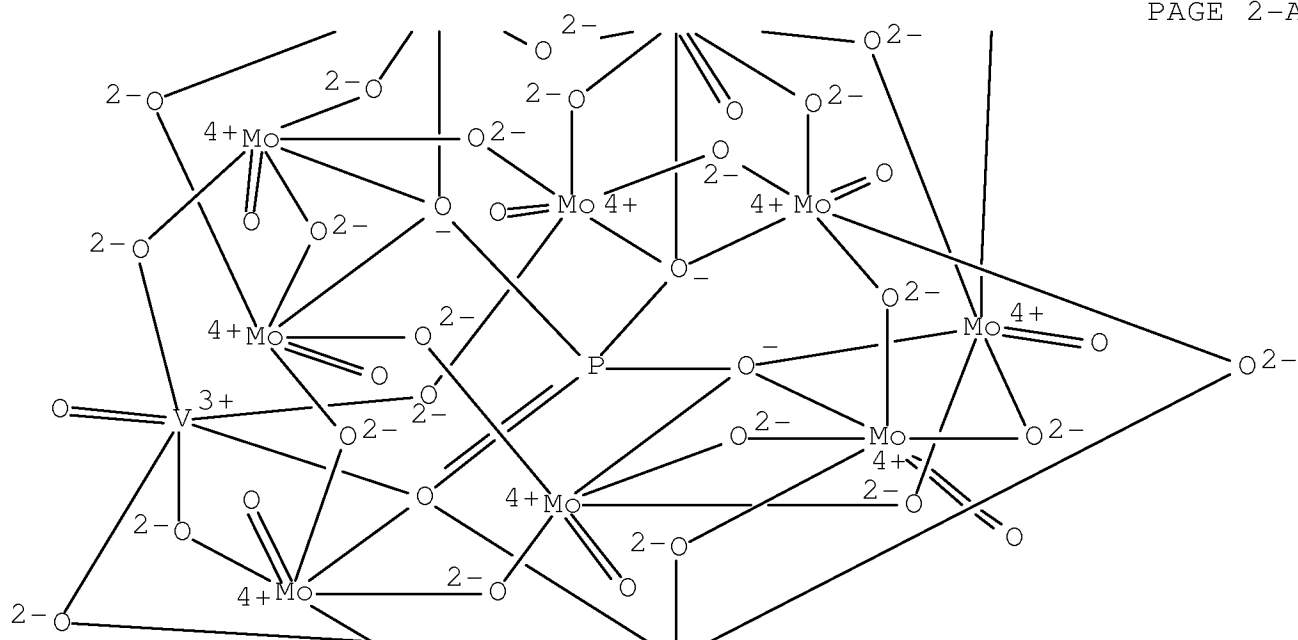
LA English

AB Heteropoly acids, HPA are well known solid acid and oxidation **catalysts** that find application in heterogeneous and homogeneous reactions. In the former, surface area and stability problems are diminished by supporting the HPA. Typical supports include oxide substrates and porous carbon materials. The HPA's show some instability on these supports however. In this work, we demonstrate that HPA encapsulated in sol-gel silica matrixes show enhanced **catalytic** performance without compromising the **catalytic** activity of the HPA. In addition, the specific role of the support in the **catalytic** process is described as well.

IT 199486-42-5

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)

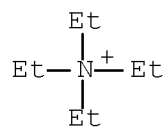
CRN 58071-93-5
CMF Mo10 040 P V2
CCI CCS



CM 2

CRN 66-40-0

CMF C8 H20 N



CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

ST support influence **catalytic** activity Keggin ion; silica influence **catalytic** activity heteropoly acid

IT Oxidation
(**catalytic**, for ethanol; support influence on **catalytic** activity of Keggin ion)

IT Oxidation **catalysts**
(for ethanol; support influence on **catalytic** activity of Keggin ion)

IT **Catalyst** supports
(support influence on **catalytic** activity of Keggin ion)

IT Heteropoly acids
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(support influence on **catalytic** activity of Keggin ion)

IT 7631-86-9, **Silica**, uses 12293-21-9 199486-42-5 199486-43-6
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(support influence on **catalytic** activity of Keggin ion)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d 149 1-4 bib abs fhitr hitind

L49 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 2003:242315 HCAPLUS Full-text

DN 138:271525

TI Oxidative process and catalysts for the preparation of 2,5-diformylfuran from carbohydrates

IN Grushin, Vladimir; Herron, Norman; Halliday, Gary Alan

PA E. I. Du Pont de Nemours & Co., USA

SO PCT Int. Appl., 19 pp.

CODEN: PIXXD2

DT **Patent**

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 2003024947	A1	20030327	WO 2002-US29464	

200209
17

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W: CN, JP, KR
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE,
 IT, LU, MC, NL, PT, SE, SK, TR
 US 20030130528 A1 20030710 US 2002-243337

200209
13

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US 6706900 B2 20040316
 EP 1427715 A1 20040616 EP 2002-763644

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17

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EP 1427715 B1 20060517
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, FI, CY, TR, BG, CZ, EE, SK
 CN 1555368 A 20041215 CN 2002-818206

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JP 2005506984 T 20050310 JP 2003-528795

200209
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PRAI US 2001-322629P P 20010917 <--
 WO 2002-US29464 W 20020917 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS CASREACT 138:271525

AB 2,5-Diformylfuran is prepared from a source of fructose in a one-pot, two-step reaction, in a single solvent system process, using a vanadium catalyst, by (a) combining a source of a carbohydrate (e.g., fructose) with a first solvent (e.g., DMF); (b) heating the reaction mixture of step (a) at a temperature sufficient to form 2,5-(hydroxymethyl)furfural; (c) adding an oxidant (e.g., air) and a catalytic amount of vanadium (e.g., V2O5) to the reaction mixture of step (b); and (d) heating the reaction mixture of step (c) at a temperature to form 2,5-diformylfuran without adding an addnl. solvent after steps (b), (c), or (d).

IT 192226-76-9P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (oxidation catalyst for the preparation of 2,5-diformylfuran from carbohydrates)

RN 192226-76-9 HCAPLUS

CN Vanadate(4-), bis[μ-[diphosphato(4-)-

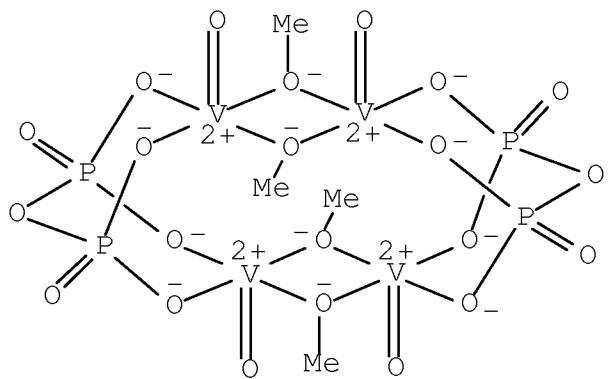
$\kappa O, \kappa O'' : \kappa O', \kappa O''']$ tetra- μ -methoxytetraoxotetra-, stereoisomer, tetrahydrogen, compd. with 2,4,6-trimethylpyridine (1:4) (9CI) (CA INDEX NAME)

CM 1

CRN 192226-75-8

CMF C4 H12 O22 P4 V4 . 4 H

CCI CCS

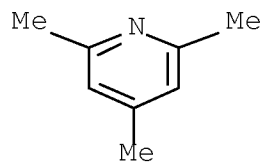


● 4 H⁺

CM 2

CRN 108-75-8

CMF C8 H11 N



IC ICM C07D307-46
ICS C07D307-50

CC 27-6 (Heterocyclic Compounds (One Hetero Atom))
 Section cross-reference(s): 45, 67
 IT 54983-07-2P, Vanadyl metaphosphate ($\text{VO}(\text{PO}_3)_2$) 192226-76-9P
 503315-65-9P
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (oxidation catalyst for the preparation of 2,5-diformylfuran
 from carbohydrates)
 IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PROC (Process); USES (Uses)
 (support; oxidation catalyst for the preparation of
 2,5-diformylfuran from carbohydrates)
 OSC.G 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (7
 CITINGS)
 RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1999:487134 HCAPLUS Full-text
 DN 131:116650
 TI Vanadium catalysts and their precursor cluster compounds for
 oxidation of butane
 IN Herron, Norman; Thorn, David Lincoln
 PA E. I. Du Pont de Nemours & Co., USA
 SO U.S., 9 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI US 5932746	A	19990803	US 1997-847411	199704 28

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PRAI US 1996-16398P P 19960429 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS MARPAT 131:116650

AB Readily processible cluster compns. of V and P are precursors to V-P
 catalysts including vanadyl pyrophosphate and vanadyl
 bis(metaphosphate). Thus, under an inert N atmospheric, 0.47 g
 vanadyl sulfate was dissolved into 3 mL 2,4,6-trimethylpyridine and 7
 mL MeOH, the solution was warmed to almost boiling, and a second
 solution of 0.18 g pyrophosphoric acid in 5 mL MeOH was added with
 stirring, the deep blue clear solution was boiled for 5 min, and

cooled slowly overnight to give bright blue crystals, which upon calcination $>700^{\circ}$ formed well-crystallized vanadyl pyrophosphate $(VO)_2P_2O_7$.

IT 192226-76-9P

RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(preparation and characterization by x-ray diffraction; vanadium **catalysts** and precursor cluster compds. for oxidation of butane)

RN 192226-76-9 HCAPLUS

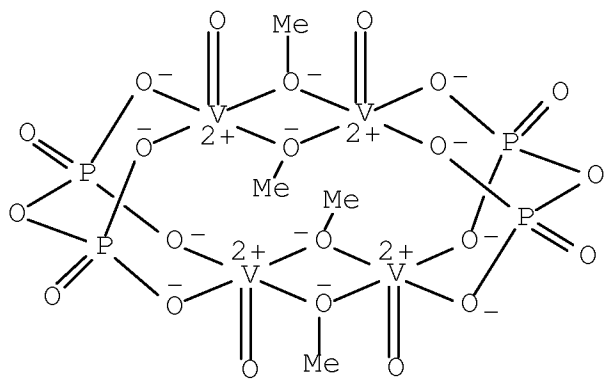
CN Vanadate(4-), bis[μ -[diphosphato(4-)- $\kappa O, \kappa O'' : \kappa O', \kappa O''''$]]tetra- μ -methoxytetraoxotetra-, stereoisomer, tetrahydrogen, compd. with 2,4,6-trimethylpyridine (1:4) (9CI) (CA INDEX NAME)

CM 1

CRN 192226-75-8

CMF C4 H12 O22 P4 V4 . 4 H

CCI CCS

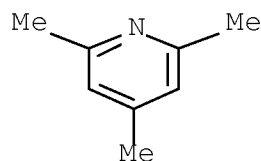


● 4 H⁺

CM 2

CRN 108-75-8

CMF C8 H11 N



IC ICM C07D307-34
 ICS B01J027-198; B01J023-16
 INCL 549260000
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 45, 67
 IT 192226-76-9P 192226-83-8P
 192332-65-3P
 RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT
 (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES
 (Uses)
 (preparation and characterization by x-ray diffraction; vanadium
 catalysts and precursor cluster compds. for oxidation of
 butane)
 IT 1306-38-3, Ceria, uses 1314-23-4, Zirconia, uses
 7631-86-9, Silica, uses 13463-67-7, Titania,
 uses
 RL: CAT (Catalyst use); USES (Uses)
 (support for vanadium phosphorous cluster; vanadium
 catalysts and precursor cluster compds. for oxidation of butane)
 OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2
 CITINGS)
 RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

 L49 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
 AN 1991:9136 HCAPLUS Full-text
 DN 114:9136
 OREF 114:1710h,1711a
 TI Manufacture of crystalline ammonium hydrogen
 phosphate-oxalate-oxovanadium pentahydrate
 IN Ladwig, Gerhard; Oliev, Elke; Martin, Andreas; Luecke, Bernhard;
 Seeboth, Helmuth
 PA Akademie der Wissenschaften der DDR, Ger. Dem. Rep.
 SO Ger. (East), 3 pp.
 CODEN: GEXXA8
 DT Patent
 LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	DD 281171	A5	19900801	DD 1987-311021	19871222

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PRAI DD 1987-311021 19871222 <--

AB The $(\text{NH}_4)_2(\text{VO})_2(\text{HPO}_4)_2(\text{C}_2\text{O}_4) \cdot 5\text{H}_2\text{O}$ (I) is manufactured by dissolving a V(V) compound in a hot (70° to b.p.) aqueous solution of H_3PO_4 and $\text{H}_2\text{C}_2\text{O}_4$ and, optionally, H_2SO_4 , reacting the solution with NH_4OH to obtain N/V/P/C atomic ratio $(1-3.5):1:(1-3):(1-3)$, and recovering and drying the resulting crystalline precipitate. The I is especially suitable for the manufacture of heterogeneous V phosphate catalysts or as inorg. ion exchanger. The V(V) compound may be V_2O_5 or NH_4VO_3 . A catalyst support or inert material, SiO_2 and/or Al_2O_3 , may be added to the crystallization solution.

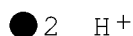
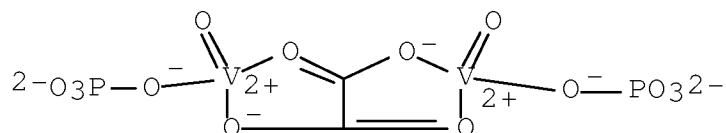
IT 129496-78-2P

RL: PREP (Preparation)

(manufacture of crystalline, for heterogeneous vanadium phosphate catalysts)

RN 129496-78-2 HCAPLUS

CN Vanadate(4-), $[\mu\text{-}[\text{ethanedioato}(2-)-\kappa\text{O}1,\kappa\text{O}2':\kappa\text{O}1',\kappa\text{O}2]]\text{dioxobis}[\text{phosphato}(3-)-\kappa\text{O}] \text{di-}, \text{diammonium dihydrogen (9CI)} \quad (\text{CA INDEX NAME})$



IC ICM C01B025-37

CC 49-5 (Industrial Inorganic Chemicals)
Section cross-reference(s): 67

IT Catalysts and Catalysis

(supports, alumina and silica, in
crystalline ammonium hydrogen phosphate oxalate vanadate
manufacture)

IT 129496-78-2P

RL: PREP (Preparation)

(manufacture of crystalline, for heterogeneous vanadium phosphate
catalysts)

L49 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN

AN 1979:44496 HCAPLUS Full-text

DN 90:44496

OREF 90:7061a,7064a

TI Catalyst for oxidation of o-xylene to phthalic anhydride

IN Glukhovskii, N. G.; Kernos, Yu. D.; Moldavskii, B. L.

PA USSR

SO U.S.S.R.

From: Otkrytiya, Izobret., Prom. Obratzsy, Tovarnye Znaki 1978,
55(39), 28.

CODEN: URXXAF

DT Patent

LA Russian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	SU 628943	A1	19781025	SU 1976-2358358	197605 14

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PRAI SU 1976-2358358 A 19760514 <--

AB The preparation of the catalyst was simplified by mixing an aqueous
solution of $(\text{NH}_4)_7[\text{P}(\text{V}_2\text{O}_6)_6]$ with TiO_2 with subsequent application of
the mixture to an inert carrier at 220-300°.

IT 68879-77-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst manufacture from, for oxidation of xylene to phthalic
anhydride)

RN 68879-77-6 HCAPLUS

CN Ammonium vanadium oxide phosphate $((\text{NH}_4)_7\text{V}_{12}\text{O}_{32}(\text{PO}_4))$ (CA INDEX
NAME)

Component	Ratio	Component
		Registry Number
O	32	17778-80-2
H4N	7	14798-03-9
O4P	1	14265-44-2

V | 12 | 7440-62-2

IC B01J037-04

CC 67-1 (Catalysis and Reaction Kinetics)

Section cross-reference(s): 25

IT Oxidation catalysts

(vanadyl phosphate-~~titania-support~~, for
xylene to phthalic anhydride)

IT ~~68879-77-6~~

RL: RCT (Reactant); RACT (Reactant or reagent)

(~~catalyst~~ manufacture from, for oxidation of xylene to phthalic
anhydride)

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